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Journal

CONFERENCE ON THE PLANNING AND EQUIPMENT OF SPECIAL LIBRARIES

The Association of Special Libraries and Information Bureaux has organised a conference which will be held at the R.I.B.A. on Saturday, 6 April, to discuss problems connected with the planning and equipment of special libraries. The conference will be in two sessions: *Morning:* Planning and equipment of university and college libraries. *Afternoon:* Planning and equipment of libraries in research organisations and industrial concerns.

The conference will be open to all members of A.S.L.I.B. and the R.I.B.A. at a fee of 10s. (non-members of either institution £1), which will include both sessions of the conference, mimeographed copies of the papers sent in advance, and a buffet luncheon. Applications for tickets should be made to A.S.L.I.B., 52 Bloomsbury Street, London, W.C.1.

Great pressure is being put on all institutions to improve their information and library services. This will be one of the subjects for discussion at the forthcoming great Empire Science Conference. In this country it is realised that the intelligence services behind research and industry are capable of considerable improvement and that the research and industrial libraries should be greatly developed. The particular advantage of a conference like this is that it can bring the users of libraries and architects together for detailed and constructive discussion.

THE "BUILDING NOW" EXHIBITION

Work on the Royal Institute's first post-war exhibition is proceeding at the high pressure customary in the last stages of any exhibition. As we said in the February JOURNAL, it is a frankly propagandist exhibition to show the architect's contribution to immediate post-war building. It is intended to demonstrate the advantages to the nation of employing qualified architects in the right way; that housing is not a mere question of numbers of dwellings but one of obtaining quality in planning, design and construction. The educational section produces evidence that architects can provide a real solution to the problem of fulfilling the school programme just as quickly as and at far less ultimate cost than the Government's proposal to use M.O.W. huts.

While architects will find a great deal of useful information in this exhibition, it is intended primarily for members of local authorities and those lay persons interested in post-war building. The Exhibition Committee, while it has expended a great deal of money and energy on publicising the exhibition, realises that the best method of getting the right people to see it is for members themselves to bring interested visitors. *Therefore members are asked to do their best to publicise the exhibition by talking about it to their non-architect friends and, above all, by bringing three or four of their friends to see it.* The Committee emphasises the fact that this is a collective effort by and on behalf of the whole profession. They ask for all the help and support that members as individuals can give. They do not want it to be merely an exhibition put up by a committee for other members to criticise or ignore.

As the first post-war exhibition, it has been extremely difficult to organise. The problems of obtaining material, having photographic enlargements made, getting printing done, etc., have been far greater than they were before the war. Nevertheless the Committee is confident that it will reach a higher standard in layout, script and technique of presentation than did any of the pre-war exhibitions and will compare not unfavourably with exhibitions organised by other bodies with far greater resources, such as the Ministry of Information.

ARCHITECTS IN PRIVATE PRACTICE AND LOCAL AUTHORITIES' HOUSING WORK

As members will no doubt appreciate, the Council have been pressing both the Government Departments and the Local Authorities concerned to ensure that architects are employed for local authorities' housing work, and as a result many local authorities who have no official architects of their own have instructed architects in private practice to prepare schemes. It is therefore particularly discouraging when evidence is submitted to the Institute that architects in private practice who have been so instructed and who have accepted the appointments have failed for one reason or another to proceed expeditiously with the work. It would appear that some architects have taken on far more work than they can reasonably hope to carry out in the immediate future and this at a time when other architects have very little to do.

When a member is approached by a local authority he should appreciate that failure to proceed with the work without undue delay reflects on the architectural profession as a whole, and in such cases, if he can see no prospects of being able to "deliver the goods" quickly, he should decline the work so that it may be passed on to another architect who is in a position to tackle it expeditiously.

THE NEGOTIATING OFFICER

In his paper on the work of the R.I.B.A., published in the February JOURNAL, Mr. A. L. Roberts [*V.P.*] referred to the forthcoming appointment of a "negotiating officer." This appointment is being made at the request of the Salaried Members' Committee, who have long felt the need for a permanent official to obtain data and to investigate complaints brought by salaried members to the Committee about conditions of service. The post has now been advertised and the Council hope to make the appointment in the near future. The Negotiating Officer will work under the direction of a joint committee representing the Official Architects' Committee, the Practice Committee and the Salaried Members' Committee. One of his chief duties will be to establish the R.I.B.A. Salary Scale as an accepted principle with local authorities.

LECTURES ON OFFICE ORGANISATION

The first of the lectures on office organisation will take place on Tuesday, 30 April, at 6.30 p.m., when Mr. J. Murray Easton [*F.*] will take the chair and other architects will give short talks on the organisation of large, medium and small offices. This, the first of a series, will cover primarily the offices of private practitioners. The principal speakers will be Mr. S. E. T. Cusdin [*A.*] on the large office, Mr. Frederick Gibberd [*F.*] on the medium office, and Mr. Richard Henniker [*A.*] on the small office.

Later it is hoped to arrange talks dealing with the various types of local authority and commercial offices. The lectures are intended primarily for architects released from the Forces and others returning to private practice who may feel themselves out of touch with present-day trends. The speakers have been asked specially to stimulate discussion and to answer questions.

Special arrangements are being made to supply refreshments, at a small charge, for those coming from offices. These will be available from 6 to 6.30 p.m. Members intending to be present are asked to telephone or send a post-card to the Secretary, The Lectures Committee, so that the necessary arrangements for refreshments can be made. The Committee feel that a service of this kind will be of considerable use to members, but they will only be able to continue it for other lectures if it is found that it is generally needed.

SERVICE IN THE R.E.

The Secretary R.I.B.A. has received the following letter from the War Office :—

F/200/AG7(L). *March, 1946.*

Sir,

Nomination of Members and Students of Professional Institutions for Service in the Corps of Royal Engineers.

I am directed to refer to War Office letter reference F/2//AG7(L) dated 4 July 1945 and to state that as from 1 March 1946, the recruitment of volunteers on Duration of Emergency engagements will cease and only exceptional enlistments will take place after that date on the authority of AG10 War Office.

It will be appreciated that in these circumstances the scheme for voluntary enlistment as a Pioneer Student in the Corps of Royal Engineers ceases to exist on the above-mentioned date, and you are requested not to forward any further applications in this respect.

I am to add that in future all members or Students under 25 years of age will have the following two alternatives :—

(1) Wait for their normal call up under the National Service (Armed Forces) Acts, and state a preference for service with the Corps of Royal Engineers as a Pioneer Student. There can be no guarantee of allocation to R.E., however, as this will depend on the requirements of the service at the time of enlistment.

(2) Volunteer to sign on a Regular engagement in the R.E. for five years with the colours and seven years on the reserve. This may be carried out on application to the local Recruiting Officer. Those who are recommended and successfully pass a War Office Selection Board and pre-O.C.T.U. and O.C.T.U. training, will be discharged from their other Rank engagement on being granted a War Emergency Commission.

It is pointed out, however, that your members and students over 25 years of age may still, if they so desire, apply for an Immediate Emergency Commission, through the Army Officers' Emergency Reserve. The necessary application forms will be forwarded on receipt of their names and particulars from your Institution.

I am finally to state that your willing co-operation in this matter has been greatly appreciated and has gone a long way to solve our officer shortage.

I am, Sir,

Your obedient Servant,

A. ASSHTON MITCHELL

(for Director of Organisation).

MEMBERS STARTING IN PRACTICE

The Council recently set up an *ad hoc* joint committee to "investigate methods of improving facilities for young architects to start in practice." The committee consists of representatives of the Board of Architectural Education (Mr. A. B. Knapp-Fisher [*F.*] and Mr. R. B. Craze [*F.*],) the Practice Committee (Mr. Joseph Hill [*F.*] and Mr. J. R. Edwards [*F.*]) and the Salaried Members' Committee (Mr. P. K. Hanton [*F.*] and Mr. Colin T. Penn [*A.*]). The chairman is Mr. Colin T. Penn.

APPOINTMENTS IN THE COLONIES

Certain information on opportunities for appointment to the Colonial Service, as outlined in Memorandum Colonial Service Recruitment No. 10. Colonial Office, March 1945, was published in the June 1945 issue of the JOURNAL. In addition, it has now been ascertained from the Director of Recruitment (Colonial Service) that architects appointed to individual colonies, being the servants of the Colonial Governments concerned, are eligible for subsequent transfer and promotion from one Colony to another and are treated as regards security and opportunity on the same basis as engineers.

R.I.B.A. STAFF CHANGES

Mr. E. J. Carter has resigned from his post as Librarian in order to take up a position as Counsellor in the section of the Preparatory Commission in the United Nations Scientific and Cultural Organisation.

Mr. F. G. Baker has resigned from the post of Chief Clerk for reasons of health and is being succeeded by Mr. H. R. Williams. Mr. Baker is undertaking special work in bringing back to normal various items of Institute organisation which have been dislocated by the war.

R.I.B.A. DIARY

Sat., 6 April, 10.30 a.m. to 4.30 p.m. Conference on THE PLANNING AND EQUIPMENT OF SPECIAL LIBRARIES.

Tues., 9 April, 6 p.m. Informal General Meeting. Sessional Paper. POST-WAR HOUSING
By *Mr. L. H. Keay*, O.B.E., M.Arch.(Livpl.) [V.-P.], City Architect and Director of Housing, Liverpool.

Thurs., 11 April, 3 p.m. Opening of the R.I.B.A. Exhibition. BUILDING NOW.
By the *Rt. Hon. Lewis Silkin*, Minister of Town and Country Planning.

Tues., 30 April, 6.30 p.m. Informal Lectures on OFFICE ORGANISATION.
Buffet open from 6 p.m.

Wed., 1 May, 5.45 p.m. Architectural Science Board Lecture. THE APPLICATION OF AIR PHOTOGRAPHY TO ARCHITECTURE AND TOWN PLANNING.
By *Mr. Frank Scarlett*, B.A. [*F.*].

Tues., 7 May, 6 p.m. ANNUAL GENERAL MEETING.

Wed., 5 June, 5.45 p.m. Architectural Science Board Lecture. SOCIOLOGY IN ARCHITECTURE.
By a *Member of Study Group No. 1.*

SCIENCE IN ARCHITECTURE

Professor J. D. BERNAL, F.R.S.

A PAPER READ TO AN INFORMAL MEETING ON TUESDAY, 12 FEBRUARY, 1946, THE PRESIDENT IN THE CHAIR.

In trying to cover such a vast subject as this, I shall inevitably be very general. I do not want to talk about the details of the application of science to architecture, and I particularly do not want to do so to-night because I am going to discuss some of the more detailed and practical aspects later on at a meeting of the Architectural Science Board. What I hope to do to-night is to show what a very large change has come over the relations of science to architecture in the last few years, particularly as a result of war experience.

As a scientist whose connection with architecture was extremely limited before the war—limited to the fact that architecture made use of substances the structures of which as a crystallographer I was studying—I at first took altogether too narrow a view of the relation between the subjects. I published in your JOURNAL before the war a paper on Science in Architecture which I now think exhibits that limitation. It was a limitation extremely common to the general relations between science as studied in universities and research laboratories to any of the arts and techniques which are the basis of civilised life; that is, the scientific aspect was extremely abstract and touched the practical aspects only through a large number of intermediary persons and organisations. We thought of science as dealing with those parts of the subject that could be directly seen to be scientific; that is, taking the example which I gave of the actual structures of materials, the factors which determine the strength of bricks or concrete or steel or, going a little further, the simple physical conditions that rule in buildings—such things as the passage of heat and of noise. All those are what may be called direct applications of science to subjects involved in architecture, but they are not, in my opinion now, really science in the scientific aspect of architecture itself.

In the same way, at the beginning of the war the scientist was conceived of as a person who produced and developed scientific weapons—scientific in the narrow sense; that is, the kind of weapons which if you did not know something about science you could not effectively use. You do not need science to use a rifle or a machine gun, but science of a sort is needed to work a Radar set. In the early days of the war, the whole emphasis of science in war was science in relation to scientific gadgets. It came about most of all, of course, in the aeroplane, which is almost scientific through and through. But, as the war progressed, it became noticed that it was not so much the scientific gadgeteering side which was important; it was the scientific approach to the problems raised by military situations generally; problems raised in the factory, production problems, planning problems in the general preparation of war weapons, and finally, towards the middle and end of the war, the problems of actual operations. While this was going on, organisation was drawing the scientists more and more closely in with the practical people. It was an experience which was common, I think, to all branches of science, and led to an entirely new and wider view of the relations of science and practical things.

As far as the scientist was concerned, it meant that the divisions between the sciences broke down. We worked very much in teams of scientists which completely crossed the old boundaries. Of course, scientists in adjoining fields have worked together often enough—physicists have worked with chemists, and so on—but in this new way of working there were not only chemists working with physicists but physicists, chemists, biologists, sociologists and economists all working together on particular problems.

One example of the kind of thing with which we were faced, and a problem which applies directly to architecture, was the problem of some M.A.P. work to make factories with the following requirements: they were not to be visible from the air; they were not to be capable of being destroyed to any serious extent by high explosive bombs; it was to be impossible to set them on fire; they were to be so designed as not to interfere in any way with production, and they were to be made with no wood and with a minimum of steel and concrete. Now, that is a large, integral problem, and it was solved in a very integral way. At the Building Research Station a group of a dozen or so people was brought together, each of whom had a special contribution to make in his own field. The A.R.P. experts were called in on the subject of layout with respect to bombing; the fire experts were called in on fire prevention; the production engineers on the production layout; and the building research people on war-time economy in materials. It was perfectly possible to get those diverse people together and to produce, as a result of the different criteria laid down by different people, something which not only satisfied the requirements but was a good deal better factory than if it had been made to satisfy the rather simpler requirements of peace-time.

It is a fact that human beings do not solve problems or attempt to solve problems unless they are put to them in a very drastic way. It is much easier to draw a factory on a drawing board in nice rectangular blocks, arranged in a simple pattern. One such factory was built during the war; it consisted of four blocks, large blocks of about 100 ft. by 80 ft. placed in a row; and a very intelligent German airman came along and dropped a bomb neatly into the centre of each block on one single run, and that factory was out of action for the best part of eighteen months in consequence. It was not that the factory had to be made like that; it was because a certain amount of time had been saved on the drawing board at the expense of everything else.

The bringing to bear of combined special intelligences on a problem is the essentially new contribution—the collaboration and co-operation of people with different technical and different scientific contributions to make. It happened by force of circumstances in the war, but it is likely now to become established as a kind of tradition. It is the pattern which will enable us to tackle a large number of other problems.

It was not really necessary in the past, because what is much simpler than the co-operation of a number of different experts is to have all the co-operation in the mind of a single person. The architects of the past were both scientists and architects. You cannot imagine that any of those who did the big architectural, engineering jobs of the past were not in part thinking scientifically and often working things out scientifically. One does not know what scientific research department Anthemius had, but it must have required a considerable amount of thought to attempt constructions of such magnitude with relatively unknown materials. The architects of the seventeenth and eighteenth centuries were either themselves scientists, like Wren, or worked closely with engineers who carried out researches of their own on the strength of materials and the suitability of various types of construction.

Architecture to-day is going through one of those major transition phases which have occurred before. It is going through a transition phase which is characterised by a change in two things at once—it is not accidental that they should go together—a change in requirements and a change in materials and methods. A very similar type of transformation, though not nearly so big, was that which occurred at the close of the Middle Ages, when the traditional stone architectural construction,

almost exclusively used for churches and castles, gave place to a construction very largely in brick for the mansions of the new wealthy class. That transition made an enormous break in architectural practice. It was a break which was eased by the fact that it did not occur in all places at the same time, and by foreign importation we were able to execute the change in this country more easily, possibly, than was the case in Italy. There was, nevertheless, a complete change in objective—the house for comfort ; first of all the magnate's house, and then the ordinary house—and a complete change in methods—really a reversion to much simpler methods than the extremely ingenious and intricate methods of the Middle Ages.

Now we are faced with a transition which has both those elements in it. The transition is to building for human requirements and human utilities, conceived of in a conscious way, and doing so under conditions which both provide and require new materials and new methods of construction. There is a difference between this and the transition of the past, in that this is a very much more conscious transition.

There is an enormous advantage in tradition. The advantage of tradition, particularly for the architect, is that once tradition is established, once it is known in a general way how materials will behave and how structures will fit together, the architect can become very much more of an artist and less of a technician. Once the instruments are there, once the rules and orders of architecture are firmly laid down, he can become almost a pure artist, and simply combine them to produce more and more novel or pleasant or merely tasteful results. With tradition there is a definite growth of change, but the growth of change is done by the old process which occurs in the organic world, the process of the survival of the fittest. If someone tries something which is a little too new and it does not work he is eliminated. The trials are done full scale, and the thinking, so to speak, is done on the job. That kind of traditional change does work, with definite limitations ; and we have now passed those limitations. The limitations are that the rate of change has to be sufficiently slow and that the materials and man-power are available in sufficient quantities for the jobs in hand. Neither of those conditions holds now.

We have in this country and in very many other parts of the world an enormous building programme, concentrating in the first place on housing. This concentration on housing may be considered to be a war measure, but in fact it has been the dominating feature of British architecture for a long time. It may be that from the point of view of the employment of professional architects housing did not play such a large part, but from the point of view of actual building effort it played an enormous part, and in the next few years is likely to play an even larger one.

If we consider that the whole direction of architecture is to be turned for a good many years to come on the provision of dwelling-space, we shall see the kind of problem which cannot be solved in a purely traditional way. Our difficulty is that we want houses very badly, we want them very quickly, and we are likely to be short of man-power to an extent of which there was no experience in past years. We have always lived in an era of potential, and usually actual, unemployment on a large scale, and the question of man-power has very seldom arisen. Similarly, the question of availability of materials, which boils down to a question of man-power in the material-producing industries, is also likely to be acute. We have therefore the pressure from the needs side to build the houses and the resistance from the means side as to materials and men ; and it is just at that point that the full collaboration between the architect and the scientist is most needed.

The problem has to be seen as one integral problem in all its aspects, and it has to be broken down in such a way that it becomes a series of manageable problems that never lose touch with each other. Those problems have long-term and short-term aspects. While we are dealing with the immediate shortage we have, as we had in the war, to put on one side a number of things which seem to us very much better solution. Take what is clearly by far the most important one—the actual materials, the basic constructional materials for houses. It is fairly clear now that the traditional materials for houses, brick and timber, are not the best materials for the job, but in fact we shall use them ; we shall use them because it will take longer to get the new materials into action than we can afford to wait for the houses. But even if we do largely put that solution to one side, we do not forget it ; we are learning all the time, in producing the marginal houses, to lead up to the big revolution in house construction. We would not come to that point of view on purely technical considerations.

In order to see what the problems are, it is necessary to begin not with the house and not with the building materials but with the people who live in the houses. It is an extraordinary thing that although we know in science a great deal about the most obscure and remote subjects, about the interiors of the stars and the centre of the nuclei of atoms, we do not know scientifically some of the most simple things that, as you might say, everybody knows.

Take one extremely striking example, but a true one . we do not really know what women do in houses. Women all know what they do in houses, or they think that they know, but when it comes to the facts, it is extraordinarily difficult to get them. That energetic body, P.E.P., in producing a very elaborate and useful summary of domestic gadgets, gave in the introductory material a table which purported to give the amount of time which the average housewife spent on various avocations—cooking, cleaning, washing up and so forth—and divided the week accordingly ; but they admitted that this table was based on an inquiry into the work of only fifteen housewives. In fact we simply do not know enough about what the house is used for.

The problem, however, is a little more complicated than that. Suppose we did know, suppose we had the most elaborate survey of what people do in houses, we should still not know what kind of houses we wanted. We should learn a great deal ; we should learn where things were worst and where the most wasteful and unpleasant work was done, and we might get ideas for making improvements ; but we must remember that all the people who could give us information are living in actual houses, essentially traditional houses, and the whole of the information that they could give us is information relative to houses of those kinds, and not to potential or improved houses. In other words, to get the real answers as to what you are designing a house for, you have to design a house—in fact a large number of houses—and put people in them and see how they get on. An experimental as well as a sociological survey has to be undertaken in order to find out the very things that we want to begin with—the requirements that a house has to fulfil.

Many of you may say to me, " That is not very important. We do not need any scientific research to know what a house is for. Everybody knows what a house is for ; a house is to live in, to keep out the rain, to be warm enough for people not to be positively uncomfortable and to provide the background for living activities, some of them of a semi-industrial kind, like cooking, and some just sitting around and playing." It will be said that everybody knows that, and that, in a sense, has been the way in which the problem has been presented on the traditional or architectural level.

Actually, however, if you consider those very simple requirements that I have mentioned you see that they themselves involve a great deal of scientific examination. If we could determine within limits the amount of air, and the amount of heat, and so forth, that are needed to provide a satisfactory, optimum, healthy atmosphere we could start in an engineering way to provide them ; but we do not even know those things. When I say we do not know, it does not mean that we are not trying to find out ; we are trying to find out. We do not even know what fresh air is. Everybody recognises fresh air when they have it, but we

do not know what it is, we do not know how to measure it or necessarily how to provide it. We know some ways of providing it, such as going out into the open, and we know the traditional method of opening all the windows wide, but if we do that we produce draughts. We should like to have a house where we could have all the advantages of fresh air without any of the disadvantages. That is not an impossibility, but in order to achieve it we shall have to do a good deal of research and a good deal of more or less full-scale experimentation.

In the same way, we do not know some of the most important things about heating. We do not know whether it is better to be gently warmed by an atmosphere at a medium temperature or to have an atmosphere at a much lower temperature and have a constant stream of radiation on us. One solution, from the other side of the Atlantic, is to say that the desirable kind of atmosphere is the atmosphere which people will pay to be in. We know that people will pay to go to Florida, to the South of France, and to Egypt in the winter. In all those places there is comparatively cool air and bright sun, and great numbers of people seem to prefer those conditions ; at any rate they do not pay nearly so much to go to the West of Ireland or the North of Scotland unless they are feeling very energetic and nature-loving. You can produce those conditions in a house. It has been done by providing a radiating surface with fairly short infra-red rays uniformly, so that you do not find, as you do with an ordinary coal fire, that there is only one point where you can be reasonably warm, and you freeze if you go a little further away or boil if you go a little nearer. With parallel heat you are just as hot in one place as in another, and that is the great advantage of sunshine.

I give that only as an example of the problems which we have to solve even in elementary physiological matters. We have to do much more than that ; we have to solve the human problems of living in houses. There is the question of how many rooms are occupied, and of whether when we demand a large number of houses we do not really let our social habits make terrific demands on our architecture. If a census were taken at the present moment of how many rooms were actually being occupied of the existing rooms which are furnished, it would probably be found that it was between one-half and two-thirds, at one time one set of rooms and at another time another. That is only a guess. There is a tradition that that is necessary, because it has always been done ; but if we could have suitable heating and ventilation we could find how to make the maximal use of the space available. The family might be spread out a little more among the rooms of the house and more privacy provided if we had suitable heating. That is one of the questions to be investigated.

There are two enormous problems which are not only the basis of architecture as far as houses are concerned, but equally the basis of architecture as far as any other kind of building is concerned ; in fact they may have been studied in more detail—it is true without any very satisfactory solutions—in the case of factories, of which fewer are built so that more attention can be given to any one of them. We need a combined architectural and scientific team, basically sociological, to investigate the requirements.

When the requirements are known, we begin to see that they involve problems of a technical kind which are not necessarily problems which are solved by traditional methods. It is fairly clear that in order to be able to control the atmosphere and the heating of a house, however we may desire to control it, we have to keep a thorough control over it and prevent heat and noise getting into areas where they are not wanted. In other words, we want insulation, and we want insulation as insulation. In the past, we have combined structure—the " firmness " of your architectural trinity—with insulation. However, far the best material of any for insulation is air, and what we really need to do in insulation is to get air cheaply. A brick had a good deal of air in it, but not nearly enough. Cork is perhaps the best that nature has done in the way of providing air suitably done up in small packets, but the modern foamed glass is probably on the way to the best solution.

If we want insulation, if we want walls, ceilings and floors which keep out heat, either a fibrous structure or a cellular structure has to be provided. With a fibrous structure it is easier to do, but while we exclude air we probably do a good deal to make the entry of moisture easy, and particularly, of course, capillary moisture ; therefore, having provided insulation against heat we have to double it with insulation against moisture. Problems of a very serious kind have come up in this connection in prefabricated houses. On the other hand, the cellular type protects perfectly against moisture, but perhaps too much against any kind of gas or vapour movement ; in other words we are sealed into our house and have to make other arrangements for ventilation and use other methods for getting rid of vapour. I do not think that that second difficulty is as important as the first, but I do want to emphasise that there are now possibilities of relying on insulation and cutting down the actual weight of material in a house by a factor of at least 10 at present, and I should not be at all surprised if in a measurable time we reach a factor of 50 or 100. A house which at present weighs about 80 tons can be brought down to a weight which is no more than is needed to support the wind pressures and the live loads.

When we try to solve this problem, however, we come across other difficulties. There is the very elementary difficulty which has held these things up in the past—that of cost. We could probably even now build an extremely light house which would be very efficient, but it would also be very expensive. We are therefore driven to another straightforward technical problem—how to get these materials, basing ourselves on low cost. There are two factors in cost : the abundance of the raw material and the simplicity of the processes of working it up. All kinds of materials which have hitherto been considered as waste materials may very well be used for these purposes. There are vegetable materials such as straw and even bracken, and old vegetable materials like peat, which have enormous uses in building once the processes of working them up into a suitable form have been properly established. There you pass immediately from the research establishment to the manufacturing problem of production. In addition to materials of the vegetable type there are the great varieties of silicate materials, from the glass type to the new foamed concrete type. They provide completely new materials with which to work. The revolution of the early 20th century from brick to reinforced concrete was, of course, a revolution of engineers, a revolution dealing with heavy building, with bridges and civil engineering construction generally. It is the light insulated materials which are going to bring about the revolution on the more domestic side of architecture.

If you have your new materials and if you know what it is that you want to make, you have still the job of making it. Here more than anywhere else is the proper field of the architect. The architect may say : " The scientist may tell us some things about what a house should do that we might not have been able to discover by intuition, and may even provide us with new materials, but the actual building of a house consists of the laying of stone on stone and brick on brick ; that is the way in which houses have been built and always will be."

We know already that a good deal has been done to get away from that, but what has been done has often been as unintelligent as the tradition, with less excuse. The iconoclast who comes across people taking small prefabricated units such as bricks and putting them one on top of the other with great artistry but considerable slowness is apt to ask : " Why not do the whole thing in one ? " Edison, with a very simple mind, said : " Why not build a mould for the whole house, take some concrete, pour it down the chimney, and there you have your house ?" He did it, but it was not a success, because he did not know and no one knew at that time that a house built of solid mass concrete poured in would not be very nice to live in even if it were cheap to make, and it was not cheap to make because of the mould. Nevertheless, the method is not a bad one and is used to-day with light aggregate or no-fines concrete. However, that method of going all out to do the exact opposite of the traditional method is just as unscientific as the traditional method itself.

The real problem is to analyse bit by bit what the operations that occur in any building are and to see how those operations can most advantageously be carried out so as to give the minimum cost, the maximum speed—because we are in a great hurry at the moment—and the minimum labour hours on the job itself. It is that acid test which determines whether any method of prefabrication is worth while or not. You lose as well as gain a great deal by prefabrication. You lose in the factory through the overhead costs of factory work. There are all kinds of difficulties, like those faced in the aircraft industry, of getting the parts to fit. Moreover, you work initially against one enormous disadvantage. The great advantage of tradition is that everybody knows how and what they have to do; the great disadvantage of new methods is that new people are doing new things, and they are bound to be inefficient at first.

Here again, however, this job can be tackled and is being tackled. In the Building Research Station and in various groups of houses which are being built under the direction of the Ministry of Works, we are trying to treat the problem absolutely rationally and without prejudice. There is a very natural difference between the person who wants to build in a certain way and the scientist or the Government department responsible to the community. The first is really trying to sell something. That is a perfectly legitimate thing to do, and he will succeed in doing it only in the long run by giving satisfaction; but his interest is necessarily biased in favour of what he is trying to sell, whereas we have to adopt a critical attitude. We have to see what each operation costs, and we have to find the sequence of operations which gives the best results. That may mean something between the fully prefabricated house and the traditional house.

After all, there is a great deal of prefabrication in the traditional house—doors, windows and many other things. Take a floor: is it easier to build a floor plank by plank on its joists in the house, or to build it somewhere else and take it to the house? In the latter case, what size of floor unit is the most economical to make? That means the balancing of a very large number of factors. It means balancing the prime cost between the factory method and the *in situ* method. If all that is done in the factory is exactly the same as what is done in the house, then the cost will be heavily weighted against the factory; but even if the factory, by using jigs and machine tools and so on, is able to do it very much cheaper, there is then the much greater transportation cost of transferring the larger units from the factory to the site, and that may outweigh the advantage. It is a very difficult and intricate subject, but a subject which can be tackled, and which can only be tackled, by a through-and through scientific analysis.

I have given all those examples to illustrate the much more extended kind of way in which science is coming into architecture in these days. You may say, and have great justification for saying, that it is not science, and others may say that it is not architecture; but, whatever it is, it is the way to get results in a complex civilisation such as we are moving into to-day. We shall have to take all these different things into account, and we shall have to get a kind of combination of scientist and architect to carry this out. It is not that the scientist is trying to take away the function of the architect or to substitute something else for any part of that function. What the scientist is really doing is adding to the traditional materials and methods of the architect, not just new materials and methods but a way of finding new materials and methods. It is introducing foresight into what was previously something just going on of itself. When the rate of change in society gets beyond a certain amount, it cannot be left to the individual genius of the architect, though he may be himself a scientist; you have to bring in the scientist, because he is the person who weighs up and assesses the results of any change.

How this is coming about is now fairly well established. There is already a very close liaison between scientists and architects in the Ministry of Works and through the Department of Scientific and Industrial Research. Every single example that I have given to-night is drawn from the experience of one or other of the actual workers in the Ministry or in the Building Research Station. The startling thing about it is that there is no individuality, nothing that is the exclusive work of one person or another. That integration, however, can be successful only if it stretches far beyond the Ministry and the Research Station into the actual work which is being carried on up and down the country. To achieve that, we have to get the willing collaboration and understanding of architects, builders, building trade workers and scientists. It is for that reason that I particularly welcome the formation and work of the Architectural Science Board. When it started—and I had the privilege of being asked to join it when it was the Architectural Science Group—it had only the idea of a programme, and we could not do any research, but only think of the kind of research which we should like to have done. Now we are starting to do the research, and from now onwards we must begin to use it.

VOTE OF THANKS AND DISCUSSION

Professor J. M. Mackintosh, M.A., M.D., F.R.C.P., D.P.H., Dean of the London School of Hygiene and Tropical Medicine, who moved a vote of thanks to Professor Bernal, said: Professor Bernal, in his very interesting address, is in a strong position, because you as architects and I as a medical man have something in common. In our own empirical work we have in the past touched occasionally on science, and Professor Bernal is doing us an admirable service in extending the field of science and bringing both architecture and medicine into much closer touch. In other words, he is teaching us to speak each other's language. He has issued an elementary but important caution that we should take care not to have undue overlapping.

The part of the address which impressed itself most on my mind is that in which Professor Bernal emphasises the need for foresight and conscious planning. We are beginning as medical people—and I am sorry to say only beginning—to learn and to study and to analyse how people live in houses and what is meant by comfort conditions.

Mr. M. Hartland Thomas [*F.*]: I am seconding this vote of thanks rather as the mouthpiece of the Architectural Science Board. I was very glad that Professor Bernal anticipated me by reminding us that he was one of the early members of the Architectural Science Group out of which the Board later developed. We in the Architectural Science Board have already had some very useful interchanges with Professor Bernal, and we look forward to more in the future. When he was remarking how important team work is in our joint labours, it occurred to me that he touched on something that is of the essence of architectural practice as we understand it nowadays. There are some of us who are somewhat afraid of this science in architecture, and it has occurred to me that perhaps we might allay our fears by turning them inside out. I am inclined to wonder whether some scientists are not rather suspicious of Professor Bernal flirting with us architects,.

I think that that is a motto for the times, because one of the things that I hold to be very important is the effect that architecture can have in bringing about a *rapprochement* between the arts and the sciences. Architecture is half-way between the two. We architects have to be scientists and, as Professor Bernal kindly remembered, we have also to be artists. We are in a very important key position, and I think that this is how we see our duties on the Architectural Science Board; we wish to assist in this *rapprochement* so that science comes out of its laboratory and works with human beings and so that we try to catch some of the scientific attitude.

Mr. D. G. Lewis (Institution of Heating and Ventilating Engineers): Professor Bernal referred to research into comfort and warmth. One thing which requires a great deal of thought is the psychological value of looking out of windows. You may have two rooms with identical conditions except that one has windows and the other has not. It has a great psychological effect on the comfort of workers, and particularly of women workers, to be able to look out of the window.

With regard to warmth and comfort, the question of monotony must not be overlooked. You can create conditions inside a room which are good from every physical aspect, but if they are monotonous

they do not give a very satisfactory result. There must be some variation in conditions. I think that the provision of a background of radiant warmth, to which Professor Bernal referred, is a great step in the right direction. There are many buildings to-day in which it is possible to be quite comfortable with the doors and windows open provided there is not a gale blowing, and that is largely due to raising the temperature of the surroundings in the room and making them of a fairly uniform temperature.

Sir Frank E. Smith: As a visitor, and as an engineer and industrialist, it is a great pleasure to me to see your beautiful building; it shows what architects in recent years have been able to do, perhaps without very much science! As a colleague of Professor Bernal on the Scientific Advisory Council, I have found it extraordinarily stimulating to see the thought processes that he has mentioned gradually evolving. I cannot help feeling, speaking as an industrialist, that the scientist is himself coming to realise how many sides and how many difficulties there are. Pure science by itself, as Professor Bernal has said, has a great contribution to make, and equally the economist, the production engineer, the planning engineer and the scientific engineer have contributions to make in evolving, developing and producing the new materials and the new methods for which we are all searching.

The overriding point that I would mention, however, is the very great benefit which is obtained by bringing in amateurs to any kind of scientific or industrial work. We have seen that in the war. Perhaps Professor Bernal would not agree that a scientist came into the war as an amateur, because he came in to start with on his own feet; but by "amateur" I do not mean a completely untrained and unlettered individual but someone who with great knowledge in his own field comes into a field which he has not hitherto studied. If you can bring in the amateur in that way alongside the technician and the scientist, and bring them together and make them work as a team, you get the benefit of experience and also the benefit of the critical outlook of the man who was brought in and who is asking "Why?" the whole time. We are realising that we have to have these integrated teams, and we are getting people to come in with that critical faculty already developed and who by asking questions will develop the faculty in others; and that is the way in which progress is made.

Mr. Michael Waterhouse [*F.*]: We have had a very interesting and extremely revealing lecture. I want to take up a challenge and to make a plea. The challenge is Professor Bernal's remark that brick and timber are not the best materials for building houses. My feeling is that of all the materials at hand and in production to-day they are the most adaptable, and it is their adaptability that makes them, of all the materials that we have at the moment, the most suitable. To my mind, adaptability is the real key to goodness in a material, and it is necessary because, as Professor Bernal has told us, there is no such thing as the standard man, the standard woman or the standard family, and, in view of the individuality of human beings, it is difficult to conceive of a satisfactory standard house. My belief is, therefore, that the new materials which science gives us should be as adaptable as the traditional brick and timber, which adaptability has made them if not now then in the past the best.

Mr. B. Haward (Association of Building Technicians): I think that the point which has just been raised about adaptability is important. I do not doubt that Professor Bernal will answer it fully, but it seems to me that adaptability has to go both ways; it is not only that materials have to be adapted to people, but also that people have to be adapted to the materials and to the techniques which are the most practical and economical at the present time. That leads us to the question of the education of the people who are going to use these materials. Professor Bernal has said that one of the big difficulties with the new methods is that you have to have new people and a new outlook in order to use them. That is true and, in order to do so, we have to have education for all the technicians in the building industry in these new methods which can give us housing much more quickly than the old ones, if they are going to be used in time. There is a traditional method at present by which technical information is disseminated, but it is a very slow method, like most other traditional methods.

Professor J. D. Bernal: I cannot help replying to at least one of the things which has been said, because I have been challenged to do so. I think that your Hon. Secretary has raised a most vital point, but it is one of those things about which we can be reasonable. In speaking of adaptability, I should like to distinguish, in the first place, between brick and timber. Timber is an eminently adaptable material. Some of you may remember an advertisement or cartoon in *The New Yorker*, in which timber was shown as being sold with the commendation that it could be "cut, planed and treated in every way as a plastic." In fact, if we were making a new material and could make one as good as timber, I think that the chemical engineers would be quite pleased. Timber is a material which I should like to see very much more used in building than it is. The reason that we do not use so much timber is not that we think that it is a bad material but because we cannot get it. Timber is a continuous material, and it is also a material with a definite isotrophy or grade, which means that it can be made into suitable shapes.

Brick scores in quite a different way; it scores because a brick is small for a man's size and he can put an indefinite number of bricks together. It would be ideal, and would give a job to all the architects in the country, and would, indeed, call for about ten times as many as there are, if everybody could have a house designed specially for him—a kind of architectural Saville Row for everybody. In that case I think that the adaptability of bricks would be fully realised. On the other hand, facing the actual facts, although the adaptability of brick enables you to build rooms of all sorts of different sizes and shapes, we do not in fact make use of that adaptability, and in the immediate future we cannot make use of it. We shall not be able to make variations in a matter of $4\frac{1}{2}$ in.; our individuality must be limited to between 3 ft. 6 in. and 4 ft. We shall have a modulus which will be so many bricks, and as far as the details of it are concerned it would be very much better if it were all one brick. There are two or three methods of construction—to my mind, fantastically nonsensical—which propose to build a whole wall of brick in a factory and put it down on the site. If anyone could provide us with a reliable brick under modern conditions, say 3 ft. by 4 ft.—an insulated hollow brick—cheaply and accurately, it would make a very good building material, but I should not hold with it even then, because we waste a great deal of coal in making a high temperature material.

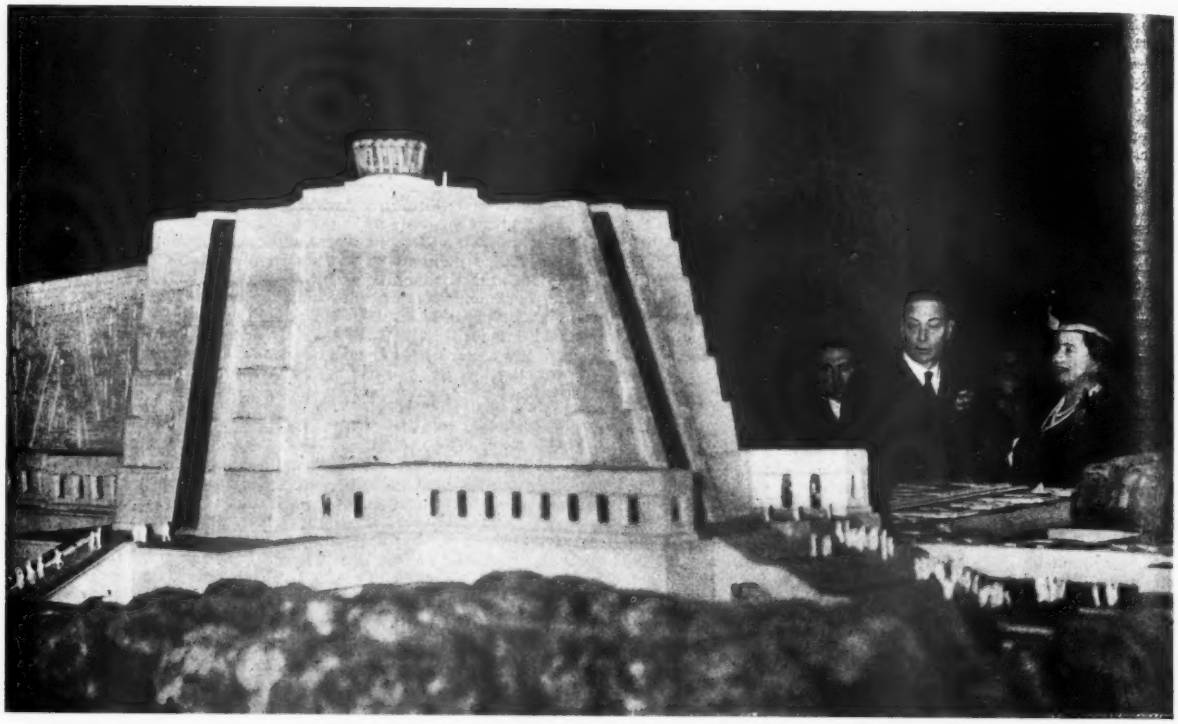
By and large, I would say that if possible we want to use no coal, or very little, in making any building materials, the reason being that building materials are required in such vast quantities that they use up an enormous amount of coal. I feel, therefore, that we must keep the ideal of adaptability in mind but try to find some other means of reaching it than bricks. No one need worry about this, because in fact we are not anywhere near getting a quantity substitute for brick, and we shall see brick houses going up for a long time to come.

Some interesting psychological points were raised about houses. Take the question of looking out of the window. I think that is where the architect comes in, not by providing a window to look out of, but by providing a house opposite that is worth looking at. I have been more depressed by looking out of some windows than by having a blank wall. We have to take these aspects well into account.

A very serious question was raised by Mr. Haward, and I should like to issue a kind of demurrer. I do not think he meant what in fact he said; what he said would give a handle to the worst enemies of science, because he said that we had to adapt people to materials. As a scientist, I should not agree to that at all. We cannot really adapt people very much, unless we do it through genetic selection. It would be very convenient for the furniture trade and for a number of others if we were to breed people who were all exactly the same size. It would make things much simpler for the wholesale clothing trade. Man is a slow-breeding animal, and it would take us about 200 years to do it, but it could be done. The point is that we do not want to do it, because we do not think that the advantages would make it worth while. It is the same with houses; we do not want to make people adapted to houses, but we want to separate conveniences and needs and wants; we want to be quite sure that when a person objects to a new kind of house he is not objecting out of pure prejudice. The answer to that is to get him to live in the house and see whether he still objects. Not many years ago when dried eggs were first brought in there was very considerable feeling against them! I do not know whether we have become adapted to dried eggs, or whether we have realised that there is something to be said for them, at least when there are no shell eggs to be had. It is the same, I think, with many houses of the kinds which we have in mind.

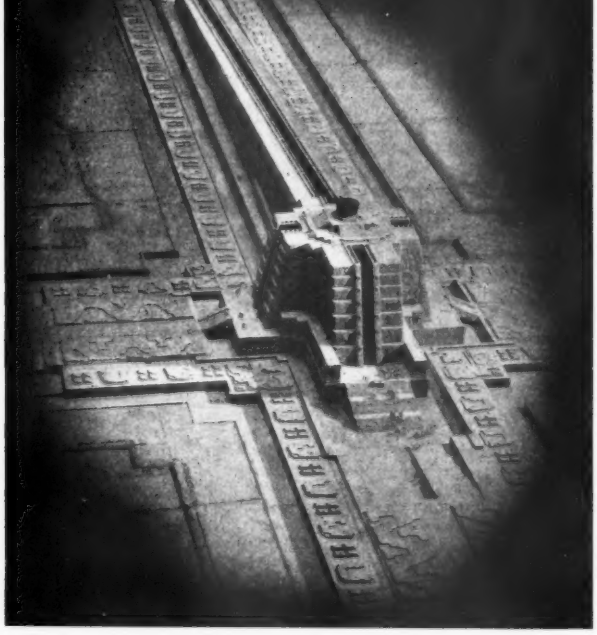
That experiment is actually going to be tried. We are having a great variety of traditional and prefabricated houses built and we are going to put people in them and see what their reactions to them are. We expect that they will object to most of them, but they will object to some of them for reasons of prejudice and others for real reasons which we hope to find out. We hope to eliminate the real objections. For instance, it is a very real reason for objecting to a house if on washing day the whole of the inside of the kitchen drips with water. It means that there is something seriously wrong with the house. There may also be something seriously wrong with the habit of filling a room full of steam once a week, but for the moment we must accept the second condition and build a house which does not make the conditions impossible if you do that. We must get rid of the real objections to the new houses, and persuade people by example, and I hope also by sensible propaganda, to accept things which are good, without having to adapt themselves at all; we want them, using their natural physiological reactions, to know when they have got a good thing.

D



MODEL OF THE COLUMBUS MEMORIAL AT THE R.I.B.A

Inspected by Their Majesties The King and Queen and Queen Mary



Their Majesties the King and Queen paid an informal visit to the Royal Institute on Tuesday, 12 March, to inspect the model of the Columbus Memorial which was on view there. They were received by the President, Sir Percy Thomas, and Lady Thomas, and His Excellency the Dominican Minister, Señor Pastoriza, and Madame Pastoriza.

The architect, Mr. J. L. Gleave, A.R.I.B.A., was presented to their Majesties and explained the design. Also presented to him were Mrs. J. L. Gleave, the Secretary R.I.B.A., Mr. C. D. Spragg and the Counsellor of the Dominican Legation. His Majesty was particularly interested in the construction and the surface material, which is a local coral sandstone, in colour a pinkish yellow. The model was illuminated, the miniature lighting installation projecting a cross of light on the ceiling in the way that the lighting of the actual building will project a cross on clouds.

Her Majesty the Queen said the design was a very inspiring and magnificent conception. She expressed the hope that Londoners would take the opportunity to see it while it was on view at the R.I.B.A.

Their Majesties remained about half an hour and, on leaving, congratulated the President and the Dominican Minister on the arrangements for placing the model on view.

Her Majesty Queen Mary also came to see the model on Wednesday, 13 March. Her visit was unannounced. The Secretary R.I.B.A. and the Public Relations Officer conducted Her Majesty round the exhibition.

The model as it will be seen from the air. The arms of the cross plan are divided by deep slits which contain searchlights. These will project a cross of light towards the sky. In the photograph at the top of the page the architect, Mr. J. L. Gleave (left) and the Dominican Counsellor (right) are explaining the model to their Majesties.

The Model on View

The memorial project, first sponsored by the Fifth Pan-American Conference, was the subject of a two-stage architectural competition held some fifteen years ago. Mr. Gleave's design was finally selected from 455 entries received from all parts of the world. The United Nations Organisation recently unanimously approved the proposal of the Government of the Dominican Republic that the project be now proceeded with.

The Government of the Dominican Republic thereupon asked the Royal Institute to allow a new model of the design to be on view to the public in the Henry Florence Hall as a first step in arousing public interest. A special reception for the Diplomatic Corps and the Press was held on Monday, 11 March. This was attended by the Foreign Secretary, the Rt. Hon. Ernest Bevin, the Lord Chancellor and Lady Jowett, Viscount Stansgate, Secretary of State for Air, and the Ambassadors of the U.S.S.R., France, Belgium, Norway, the Netherlands, Poland, Chili, Czechoslovakia, Colombia, Portugal, Spain, Uruguay, Yugoslavia, Iran, Peru, Brazil and Venezuela. The United States Ambassador was represented by the Chargé d'Affaires, as was also the Argentine Ambassador. The Ministers of Ethiopia, Guatemala, Cuba, Luxemburg, Iceland, Switzerland, Ecuador, Paraguay, Syria, Denmark, Liberia, Afghanistan, Sweden and Hayti were also present. The guests were received by the President, Sir Percy Thomas, and Lady Thomas, and by the Dominican Minister and Mme. Pastoriza.

A similar reception for members of the R.I.B.A. Council and Committees was held on Tuesday, 12 March.

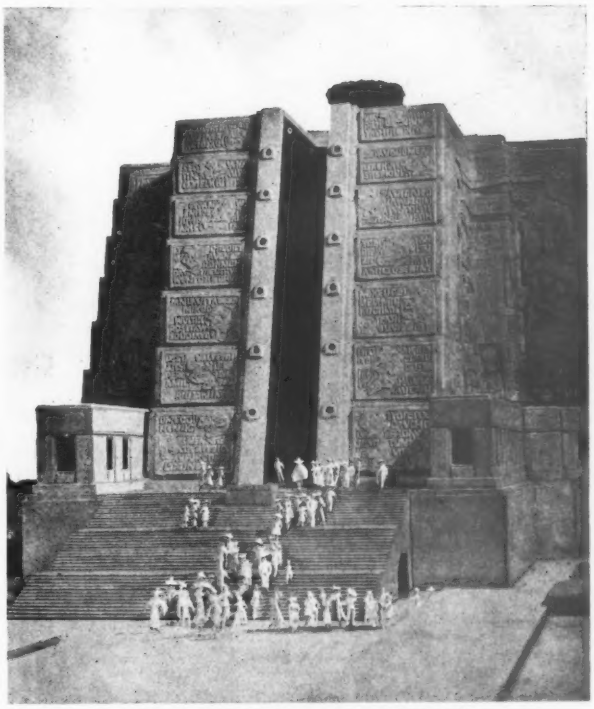
The Design of the Memorial

The Columbus Memorial lighthouse is to be erected on a park-like site of 2,000 acres, presented by the Dominican Republic, situated close to the ancient city of Ciudad Trujillo, where Columbus built his first capital city. The memorial is not so much a monument to the man Columbus as to the growth and progress of the New World which he initiated.

The memorial is an air and sea lighthouse in the form of a huge recumbent cross and will be situated on what is a world traffic cross-roads. The actual building is about 1,200 ft. long and 100 ft. high. The arms of the cross have deep slits or canyons down their centres in which are to be batteries of powerful floodlights which will project the cross shape towards the sky. A single revolving light on the summit will serve as a sea mark.

In the heart of the building will be a memorial chapel housing the tomb of Columbus, whose remains now lie in the cathedral of Santo Domingo. Associated with the memorial chapel will be museums and libraries.

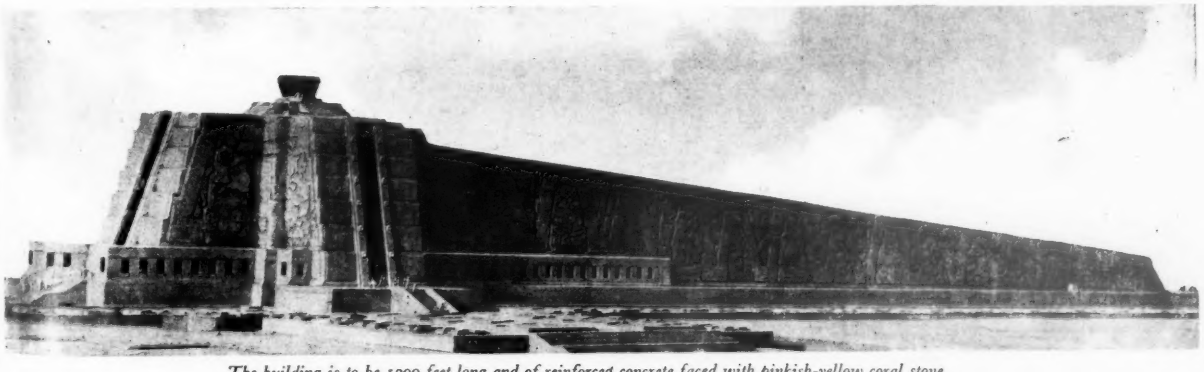
The structure is of reinforced concrete, designed to resist earthquakes and hurricanes, faced with coral stone on which will be carved the names of those men and women who have contributed to the progress of the New World. At the present time trial holes are being excavated and the contract drawings prepared. Work is to start as soon as possible and will be completed in four or five years. The cost is estimated at £1,000,000. The money is being subscribed by the 28 republics of the Americas.



The main approach towards the chapel and tomb of Columbus in the heart of the building

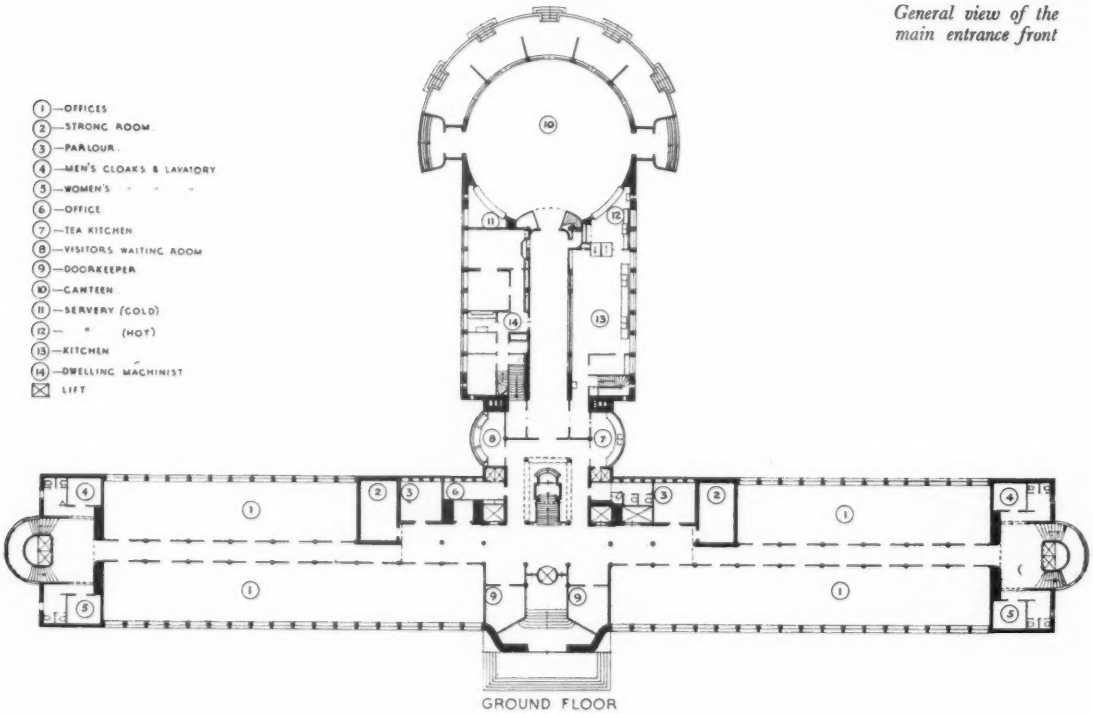
Public Interest

In spite of the fact that a purely monumental building has little popular appeal at a time when the nation is preoccupied with problems of reconstruction and housing, the exhibition was very well attended. The B.B.C. and the Press gave it considerable mention, the former describing and discussing it in overseas broadcasts as well as in the Home Service. This justified the belief of the President and Council, in agreeing that the model be shown at the R.I.B.A., that it was the duty of the Royal Institute to take a long-term view of architecture and that the showing of the model would symbolise a peaceful and prosperous future. The exhibition and attendant functions can be regarded as among the most successful of the many organised by the Royal Institute.



The building is to be 1200 feet long and of reinforced concrete faced with pinkish-yellow coral stone.

General view of the main entrance front



GROUND FLOOR

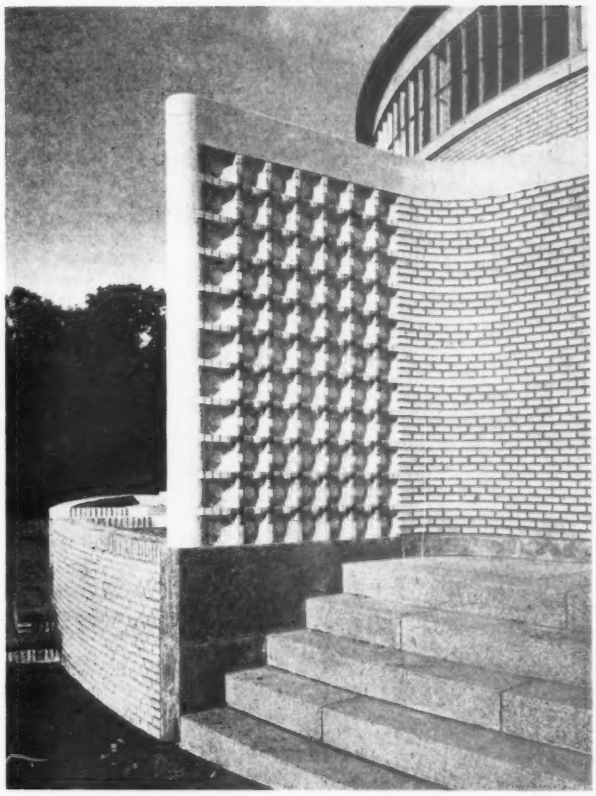
THE SHELL BUILDING THE HAGUE

Architect : J. J. P. Oud

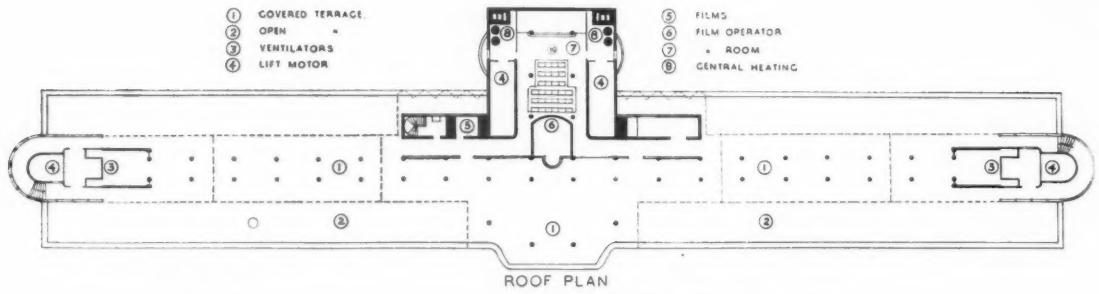
This office building was begun in 1939 as the offices of the *Bataafsche Import Maatschappij*, which is the Dutch section of the *Shell* oil combine. When the Germans invaded Holland on 10 May 1940, the building had reached the second floor. Later the work was continued under great difficulties and made ready for use in 1942, though many details of finish, both inside and out, have never been completed.

The building was first used as a food office, housing 1,100 employees, though it had been designed for 600. Towards the end of the war it was used by the Germans as a telephone centre for the organisation of the V-weapon offensive on Great Britain. At that time most of the building was unused because it lay within a zone of special defence. It was then twice bombed by the R.A.F., but its strong frame withstood serious destruction, though it has required several months' repair work, mostly the replacement of doors, windows and other lightweight elements. The facing of the building was also extensively damaged. The photographs reproduced here were taken before the building was bombed.

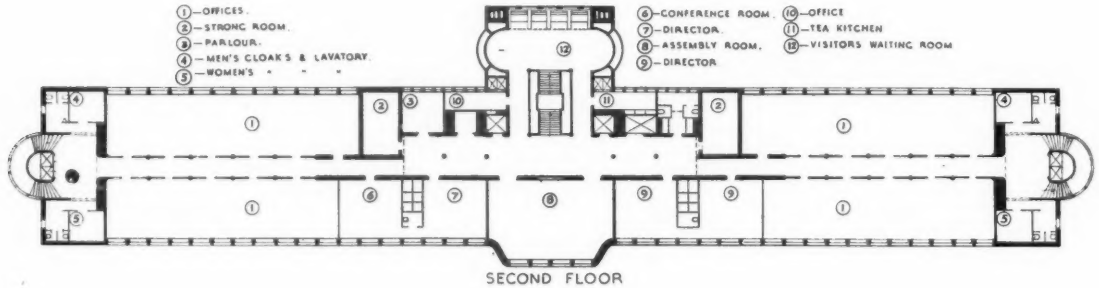
The structure is a reinforced concrete framework of columns, beams and floors. It is faced with cavity walling of yellow-white hand-made bricks forming the outer skin, a 5 cm. cavity and an inner skin of common bricks. Partitions are of a soft porous brick. The column faces on the elevations are faced with cast concrete made of powdered natural stone. The pre-cast units were used as permanent formwork ; they were built first,



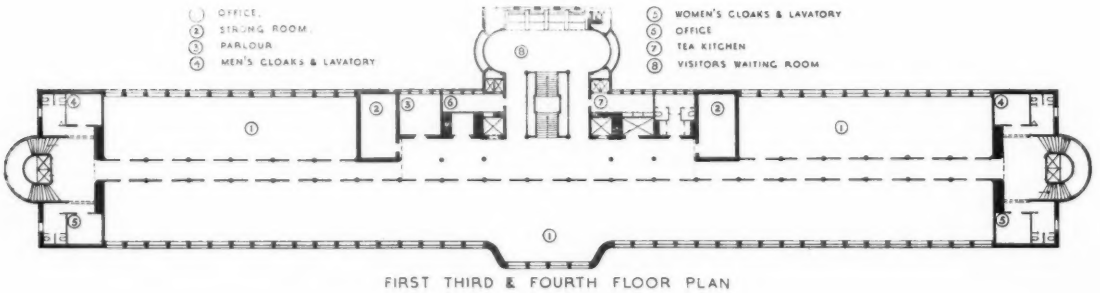
Right : The entrance to the canteen from the garden is decorated with coloured tiles. Below : the canteen (in the foreground) is surrounded by a screened terrace. The walls are surfaced with yellow-white bricks.



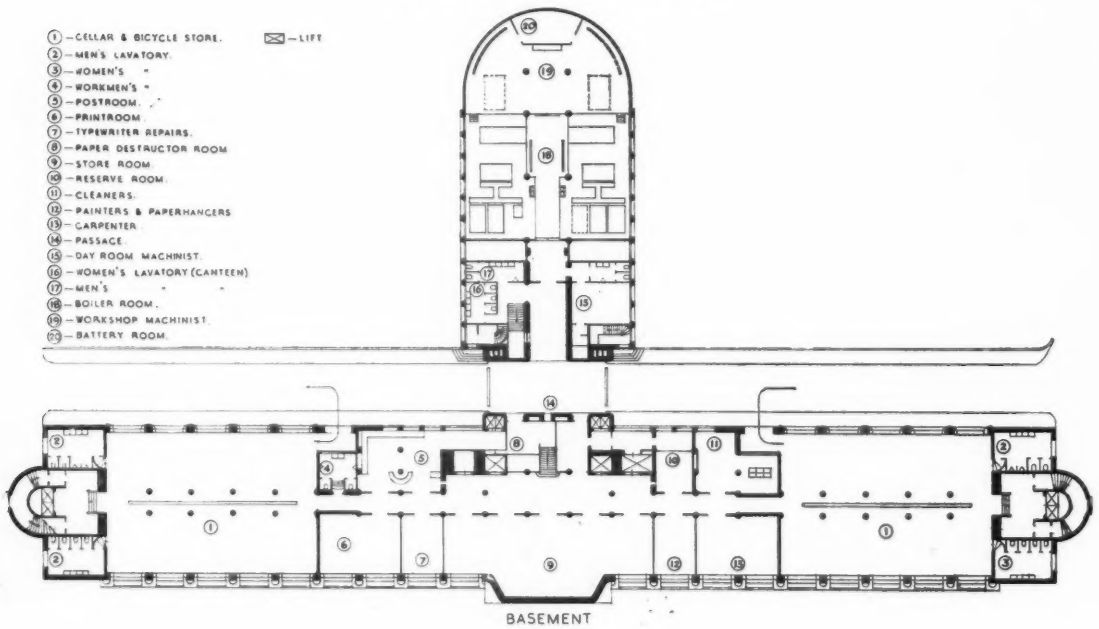
ROOF PLAN



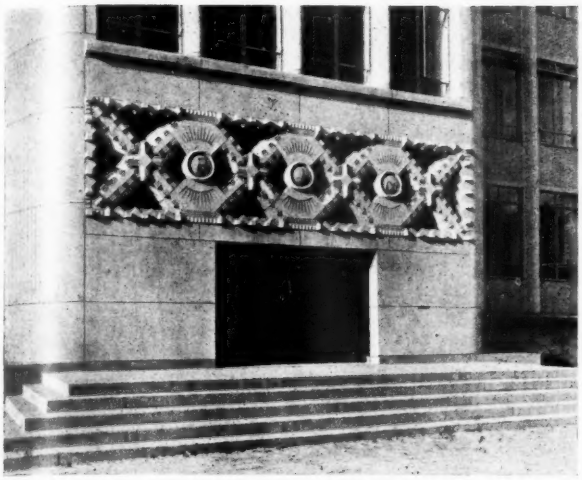
SECOND FLOOR

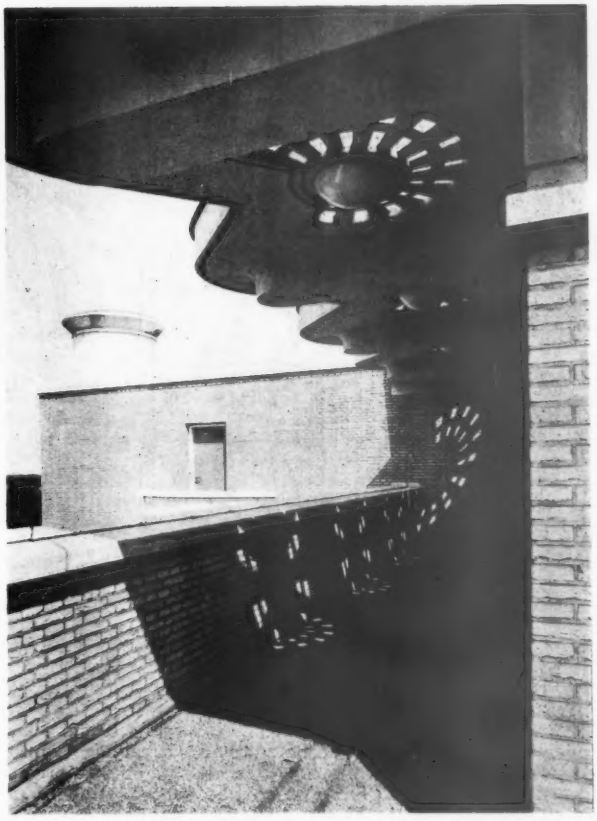


FIRST THIRD & FOURTH FLOOR PLAN



BASEMENT

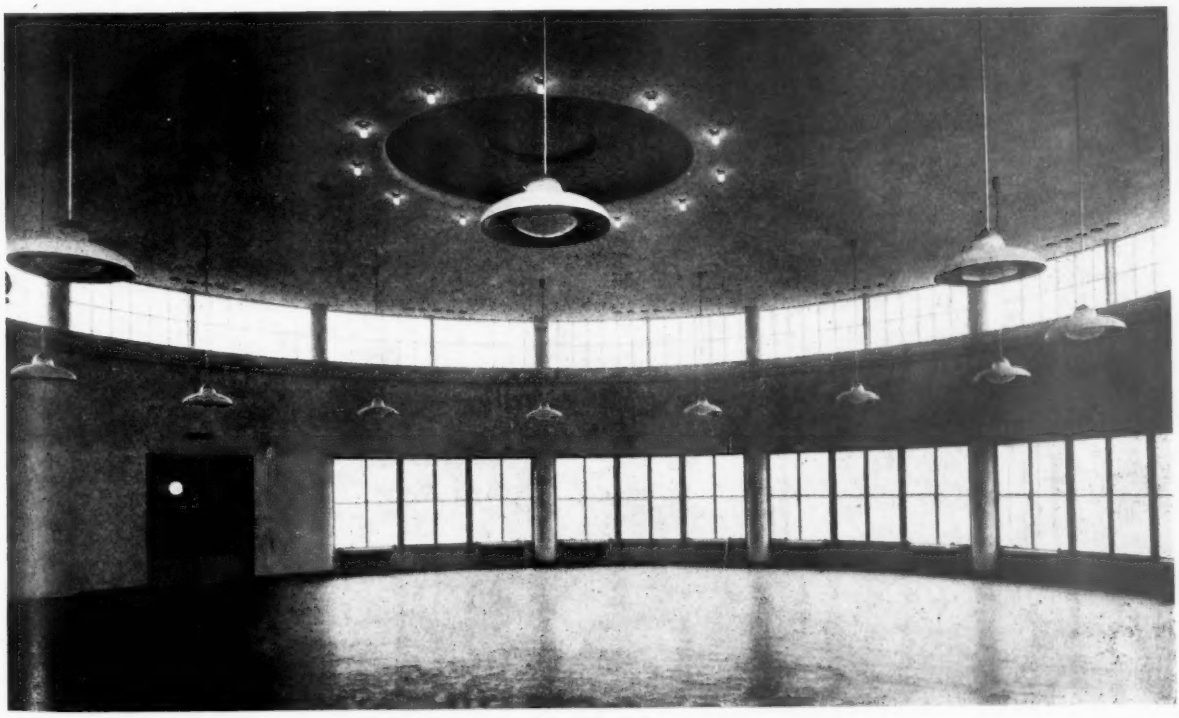


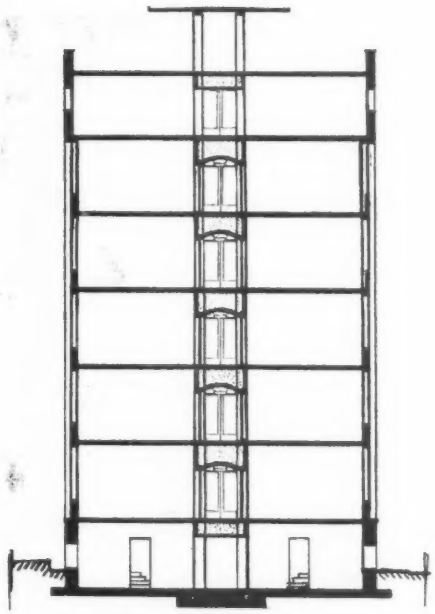


Above : The main entrance, of carved sandstone. Right : On the roof. Below : Interior of the canteen.

the reinforcement being placed afterwards and the concrete poured. The entrance surround is of Euville sandstone and the outer walls of the basement faced with travertine from Langensalza. These materials give the building an appearance of being composed in tones of white and off-white.

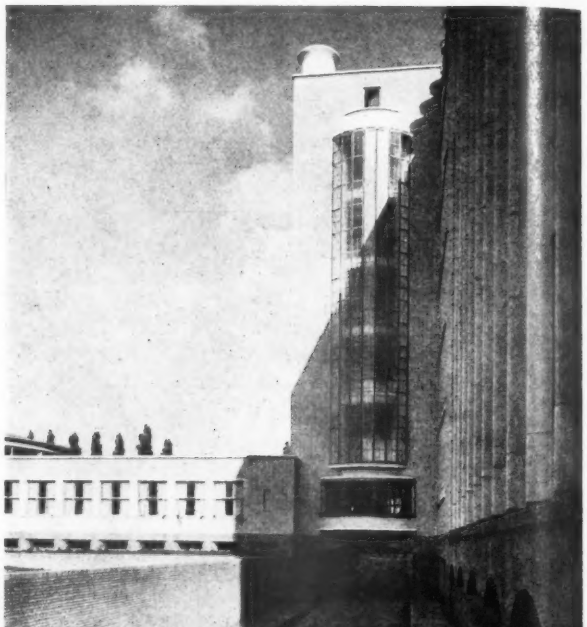
Among the finishing details which were temporarily omitted were bronze cornices designed for the tops of the semi-circular staircase towers. The layout is not yet complete : two bridges are planned to go in front of the main façade, as well as a filling station, designed to harmonise with the building. Inside, the decorative grids over the radiators, the brass balustrades of the





staircases and the panelling of the assembly room, board room and principal offices were omitted. These items of finish will be provided as soon as circumstances permit.

Mr. Oud is one of the leading architects of Holland. For many years he was head of the Rotterdam Building Control Department, but has also done a great deal of work in private practice, including the Kiefhoek housing estate in Rotterdam, a housing estate at the Hook of Holland, exhibition buildings, notably at Stuttgart, and a considerable amount of ship decoration. He is also well known in Holland as a writer and editor.



Above: The access road to the basement. Below: General view of garden front Bronze cornices are to be provided over the staircase towers at the ends.

PAINTING PLASTER*

H. M. LLEWELLYN, B.Sc., A.R.I.C.

Of the Building Research Station of the Department of Scientific and Industrial Research.

A Paper read at a Meeting of the R.I.B.A. Architectural Science Board on Wednesday, 6 February, 1946.

H. V. LOBB [*F.*], in the Chair.

Earlier lectures in the present series have dealt with Paint and Painting in general and with Plastering. It remains for me to combine these topics by talking about the painting of plastered surfaces. Mr. James Lawrance took, as the basis of his lecture, Post-War Building Study No. 5—"The Painting of Buildings." This publication, as he told you, contains recommendations for painting on various types of building materials and these recommendations are now being set out in greater detail in a series of Codes of Practice for the painting of individual materials—wood, metals, plasters and so on. These Codes, in turn, form part of a series dealing with finishes to floors, walls and ceilings.

Since the Royal Institute of British Architects is the authority responsible for preparing this particular series it will be appropriate if I use this occasion to illustrate the main principles on which the Codes of Practice for painting plaster will be based.

I should, perhaps, start by explaining that every code, besides making specific suggestions as to how an operation should be carried out, will also include an important section calling attention to any special facts or features which should be taken into account when planning for that operation. For example, in the Codes for painting plaster, this section will describe how different plasters may affect different types of paint and will indicate what precautions are needed to ensure the best chance of success. Most of what I have to say to-night will be concerned with these "Design Considerations."

Plaster as a Ground for Painting

A dry plastered surface has much to commend it as a ground for painting. It is rigid and, if properly prepared, not friable, yet somewhat porous, so that it will hold paint well. It need not be so dead smooth as to lack character. It does not rust like iron or steel and it has no knots, joints or nail-holes requiring special treatment like wood. Once it is properly dry and hard, it is relatively little affected by fluctuations of atmospheric humidity or temperature and so it does not need a highly elastic or impervious coating. Consequently, plaster lends itself to a wide range of decorative finishes.

But of course that is only one side of the picture; a slab of plaster made, dried and painted under ideal conditions in a laboratory is a very different proposition from the plastered walls of a new house, office or school where all sorts of complications may arise in the form of dampness, efflorescence, condensation and so on. And so it happens that although there are plenty of examples of plasterwork which has been decorated quite successfully, one occasionally comes across some spectacular failures—such as that illustrated in Fig. 1.

I shall be referring to this case again later on. The point I want particularly to emphasise at the moment is that gross failures of this kind need never occur. For example, the reasons why this particular job failed have now been pointed out and the walls have been replastered and painted successfully. This could have been done in the first instance if the nature of the risks had been realised and suitable precautions taken. This is only one of the many different types of defect which we have been asked to investigate at the Building Research Station, so it may help you to profit by other people's misfortunes if I attempt to classify and analyse the commoner causes of trouble.

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Chemical Action of Plasters on Paint

One type of paint failure is due to a chemical action of the plaster on the oil in the paint. If the plaster contains caustic alkalis it sometimes attacks the oil converting it into soap—hence the effect is called "saponification"—and the paint becomes soft and sticky and may form yellow soapy runs (see Fig. 2). Sometimes caustic alkalis cause the coloured pigment to become bleached as well, especially certain blues and greens.

This particular type of defect is most likely to occur on Portland cement concrete and rendering, asbestos cement sheet and certain lime plasters, since these materials generally contain caustic alkalis. Gypsum plasters are not usually alkaline and so they

FIG. 1. *"Delayed expansion" of painted Keene's plaster. The plaster finish was allowed to dry too quickly; after painting, moisture re-diffused into the plaster causing expansion and disruption.*

FIG. 2. *"Saponification" of oil paint and efflorescence of salts on alkaline plaster. The wall was painted before it was dry throughout.*

FIG. 3. *Apparatus for measuring the dampness of a wall*

seldom cause saponification or bleaching but they may do so if any lime is added to them by the plasterer. It is quite legitimate to gauge gypsum plasters with lime for some purposes, but obviously if this is done, the decorator should be informed.

Supposing, then, that the plaster is known to be one which is likely to attack the paint, how can saponification be avoided? The best way is to let the wall dry thoroughly before attempting to paint—at any rate before using an oil paint. If we take a series of lime plaster specimens containing alkalis and paint them successively at intervals we find that the attack becomes less and less as the plaster becomes drier and after a certain stage, no saponification occurs. It is quite impossible to tell merely by looking at or feeling a plastered surface when this "safe" stage has been reached but one way is to paint small trial areas with a coat of undercoating, tinted with prussian blue to make it more sensitive, and watch them for a few days to see if there are any signs of attack.

An apparatus has been developed for the same purpose at the Building Research Station but it is not yet on the market (see Fig. 3). This measures the humidity of the air in a small enclosed space close to the plastered surface and so indicates the degree of dryness of the plaster itself. We find that when the humidity shown by the instrument falls below a certain value (which varies according to the alkali content of the plaster) the risk of chemical attack ceases. With strongly alkaline plasters it is necessary to dry until a reading of not more than 65 per cent. R.H. is obtained.†

Unfortunately it generally takes a very long time for a newly-plastered wall to dry to this extent for there is not only the water in the plaster itself but also, very often, a much larger quantity in the brickwork or other backing. Obviously, then, it is not safe to apply oil paint to alkaline plasters or cement in the early stages, but this does not necessarily mean that no decoration of any sort can be applied. One possibility is to use, in the first

† D. G. R. Bonnell and A. Watson—"Chemical Attack on Oil Paints Applied to Plaster Work"—J.S.C.I. Vol. 57, June, 1938. pp.183-189.

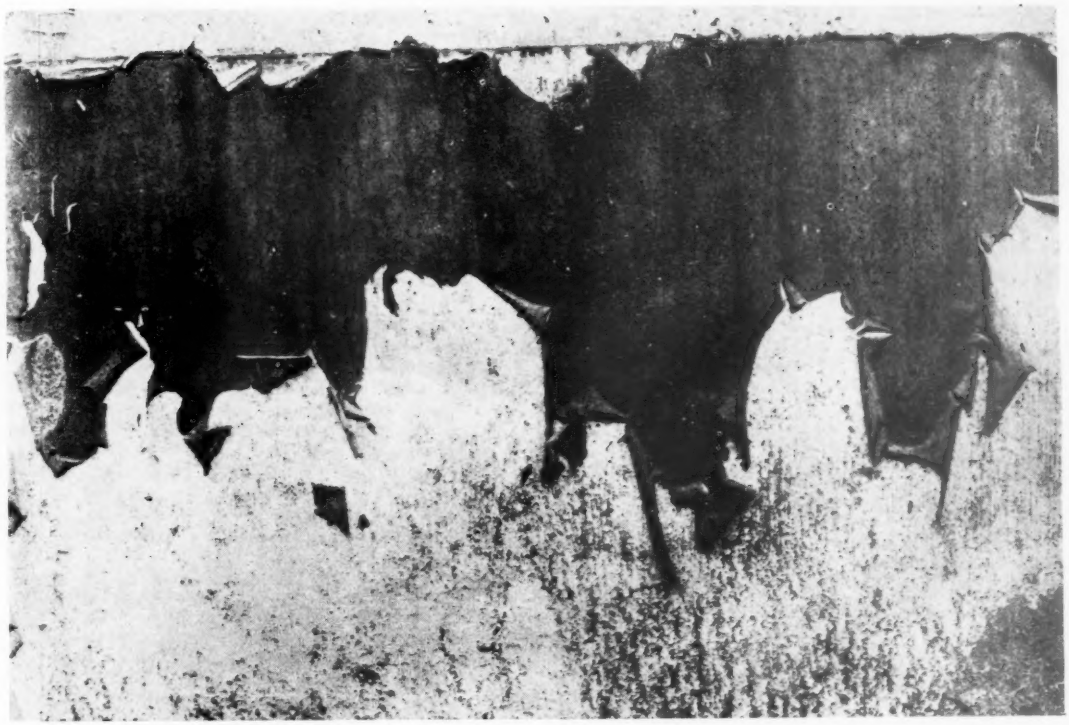


FIG. 4. *Peeling of paint from a damp plaster surface.*

instance, a temporary decoration of a type which will not interfere with drying and which can be removed later—such as a "non-washable" distemper. For concrete or cement rendering there are paints themselves based on Portland cement and these, of course, are immune from attack but they are not suitable for use on damp gypsum plasters.

Oil-bound distempers are attacked by caustic alkalis but not so readily as oil paint, and in some circumstances they can be used with reasonable success, provided the wall is not too wet.

If the plaster has had a fair chance to dry out and it is desired to apply oil paint the primer used should be one specially formulated to offer resistance to the attack of alkalis. A paint of this sort cannot reasonably be expected to stand up to severe conditions of dampness and alkalinity, but it will enable oil painting to be done successfully sooner than it could with an ordinary type of primer.

Finally, of course, any coloured pigments which are affected by alkalis, such as prussian blue and brunswick green, should always be avoided, whatever type of paint is used.

Failure of Adhesion

Let us now consider another type of failure—that in which the paint loses its adhesion to the plaster and peels or flakes off (Figs. 4 and 5). In the worst cases, the paint coating comes away from the surface in large sheets and can be stripped off like wallpaper but fortunately this is very exceptional. Peeling, when it occurs, is more often confined to portions of perhaps one or two walls of a single room—although that is annoying enough and spoils the appearance of a whole job. Sometimes, too, the trouble is persistent and the paint still refuses to stick when the work is done all over again. We have often been asked to investigate cases of this sort and it is not always easy to find out why a paint suddenly becomes defective in one room when it is apparently quite sound elsewhere.

It is helpful in this connection to consider just why and how paint sticks to plaster, or any other surface. For example, does it depend on the paint penetrating into the pores of the surface and so getting a mechanical grip when the film dries? Not necessarily, for oil paint will stick perfectly well to a smooth, non-porous surface such as glass—as anyone knows who has had to remove blackout paint from roof lights! If the adhesion is not purely mechanical it must be due to the physico-chemical forces of attraction between the paint and the surface. We call this "specific adhesion."

At the Building Research Station we have made a large number of tests on different plasters having a wide range of porosity to find out how much the adhesion of paint is affected by the porosity of the surface. We use two methods of test, one a rough-and-ready "strip-off" test which will show whether the adhesion is strong or weak; a piece of scrim is glued on the painted surface and then pulled off, together with the paint, by hand. The other method, in which a block of wood is glued on and then pulled off in a tensile testing machine (Fig. 6) gives us some sort of quantitative measure of the strength of adhesion—not very exact, but still useful for comparative purposes.

The following are some results obtained on a series of dry plasters with an ordinary type of linseed oil/white lead primer :—

Porosity (per cent. by volume) :

63 51 43 36 32 27 22 15

Adhesion (lb./sq. in.) :

39 72 96 103 122 178 153 180

Even the lowest adhesion value is enough to ensure that the paint will stick to plaster reasonably well but it will be noticed that the less porous the plaster, the better the adhesion. This suggests that the paint depends more on specific adhesion than mechanical adhesion.

The next question is, what happens if the plaster is not dry? We took some of these same specimens which had been dry when painted and let the plaster absorb water by standing them on damp cotton wool.

FIG. 5. *Distemper flaking from a plastered ceiling.*

Owing to their different porosities, some absorbed water more quickly than others but we found that as soon as the water reached the back of the paint film, the adhesion fell to a much lower value (less than 50 lb./sq. inch and often less than 20 lb./sq. inch). The results were more variable because of the different rates of absorption of water but, generally speaking, the paint on the more porous plasters retained more of its original adhesion than that on the denser plasters. It would appear that the effect of water is to destroy the specific adhesion and leave only the mechanical adhesion. This is supported by the fact that if the plaster is dried out again the paint adheres as strongly as it did originally.

These observations help to explain what happens on a wall. When first plastered, the surface is, of course, quite wet, but after a few days or weeks it may look and feel quite dry even when the brickwork behind the plaster is still wet. If a sheet of glass is placed against the plaster, moisture will be seen to condense on it, showing that the backing is damp. The same thing happens, although it cannot be seen, if the plaster is sealed with oil paint ; moisture condenses at the back of the paint film and destroys most of the adhesion. Heat from the sun or a radiator may then expand the air or water vapour behind the film causing blistering or perhaps general peeling.

If, however, the paint " coating " is not impervious but porous, the water vapour can escape without condensing and there is less risk of failure of adhesion. On plaster which is new and not properly dry, therefore, it is safer to use a porous coating such as a distemper or flat oil paint. A glossy finish can be applied later, if desired, when the wall is quite dry.

Peeling Sometimes Due to Friable Condition of the Plaster

When paint peels or flakes off, it is not always due directly to dampness of the plaster. If we examine a piece of paint film which has peeled off, we sometimes find that instead of coming away cleanly, it has carried with it a thin powdery layer of the plaster. This is a sign that the plaster has not hardened properly and quite likely this in itself is enough to account for the failure. The condition of the plaster, however, is not necessarily the fault of the material or of the plasterer. A gypsum plaster surface may appear quite sound and hard when painted, yet soften up after the paint has been applied, owing to water finding its way back to the plaster in the way I have just described.

Again, Keene's and other hard-burnt plasters sometimes take a long time to combine with all the water they need for proper hardening. If they are allowed to dry out too quickly in the early stages—for example, if the weather is hot or the room is artificially heated—they may not have time to become fully hydrated ; then, if water subsequently diffuses into the plaster, expansion takes place unevenly and the plaster skimming coat blisters, softens and becomes powdery, with disastrous results. That is what happened in the case illustrated in Fig. 1. The same effect is often seen in plaster under window sills, owing to the penetration of rain through the sill or brickwork.

Some modern hard-burnt plasters are made to hydrate more quickly to avoid this trouble. Hemihydrate plasters all hydrate quickly and so do not suffer from the same disadvantage. The obvious precaution in any case is to avoid extreme conditions of drying and to protect the plaster for the first few days and, again, to avoid sealing in moisture.

It is my belief that one of the chief reasons behind the old practice of priming Keenes with a coat of sharp colour immediately following the trowel is to retard the drying slightly while the plaster is hydrating, and so help to secure good adhesion of the paint. I know of no other advantage of this practice. It does not enable the plaster to be painted safely any sooner than it could be otherwise. Also, a word of warning is necessary for if the priming paint used following the trowel is not " sharp " but oily, the oil, in penetrating into the partially set plaster will itself prevent proper hydration and give a weak, powdery layer

corresponding to the depth of penetration of the oil. Examples of this effect have been seen in practice and reproduced in the laboratory. The depth of penetration can be detected and measured with the aid of a fluorescent dye, viewing the specimen in ultra-violet light.

Condensation of Moisture and the Flaking of Distemper

A special example of loss of adhesion is seen in the flaking of distemper. This occurs most readily on the denser types of plaster and is often due to repeated wetting and drying, such as takes place in bathrooms and kitchens. The glue in the distemper film expands on wetting and shrinks strongly on drying with the result that the film gradually loses adhesion to the surface. Since the film is brittle, it tends to crack and fall away in flakes, instead of peeling off in large strips. On more porous surfaces the coating continues to adhere for a longer time.

An interesting example of the flaking of distemper is shown in Fig. 7. This is a large building, with massive reinforced concrete piers and beams and lighter panel fillings, in which large gas furnaces are frequently in operation. The whole interior surface is distempered and the distemper has flaked badly on all the piers and beams but is still intact on the panel fillings. The probable explanation is that condensation occurs most readily on the more massive portions since these do not warm up as quickly as the lighter areas.

Another example of differential condensation (not in this case accompanied by paint failure) is illustrated in Fig. 8, which shows the painted exterior surface of a 4½-inch brick wall which is supported at the back by 9-inch brick piers. On a hot summer day the wall became thoroughly warmed but when the air temperature suddenly fell below the dew point, moisture condensed on the paint everywhere except at the places backed by piers, thus leaving a series of lighter-coloured vertical strips 9 inches wide, one of which is shown in the photograph. In this case the more massive piers cooled down more slowly than the thinner parts of the wall so that at first no moisture condensed on them. By next morning, when all the wall had cooled, condensation appeared uniform over the whole surface. The paint in this instance was a bituminous paint and almost completely non-absorbent, which explains why the moisture became conspicuous as soon as it had condensed.

Paints for Surfaces Frequently Subject to Condensation

Almost any type of paint coating will eventually show signs of breakdown if repeatedly wetted and dried, but the more impervious the paint the less easily will it be affected. From this point of view it is an advantage to use a good quality high-gloss paint in any situations where heavy condensation is to be expected. Such paints, however, suffer from the disadvantage that the condensed water drips or runs off the surface and so may become a nuisance.

The wisest plan, obviously, is to take all possible steps to minimize condensation, e.g., by providing better ventilation, but a useful compromise between a full-gloss paint and a porous distemper is afforded by a moderately porous type of flat oil paint which is able to absorb condensed moisture to a reasonable extent and yet, being an oil paint, does not tend to flake or lose adhesion so readily as a distemper.

In certain situations it may be preferable to use a special anti-condensation paint based on the principle of heat insulation, e.g., paint containing granulated cork or similar insulating material in a varnish medium.

Efflorescence

A well-known cause of paint failure, not only on plaster but also on bare brickwork and other building surfaces, is the crystallisation of soluble salts, generally known as efflorescence. This is most often seen on the external walls of a room, especially around window openings. The failure occurs in patches and takes the form of flaking of the paint, or sometimes blistering, caused by a deposit of salts on the surface under the paint coating.

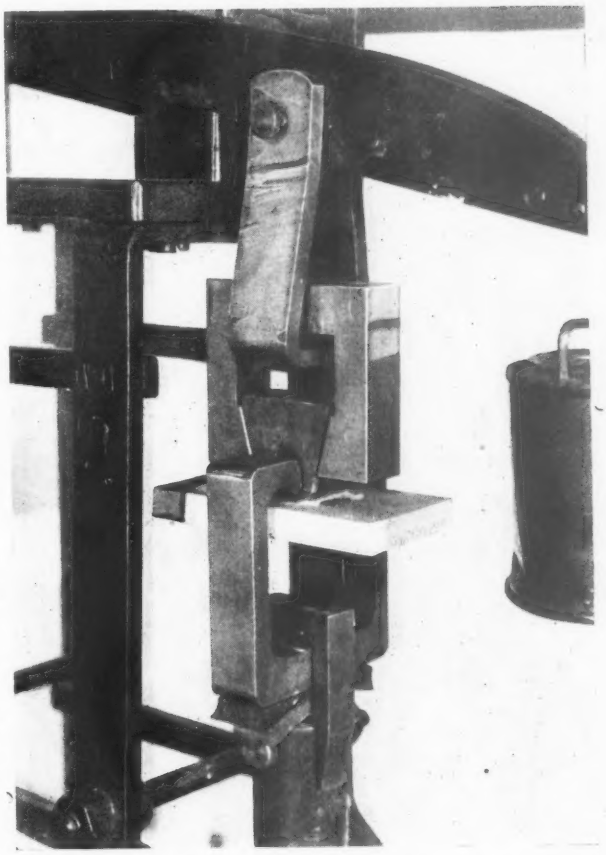


FIG. 6. *Tensile test for measuring the adhesion of paint to plastic specimens.*

Since it is practically impossible to tell in advance whether a surface is likely to develop efflorescence or not, it is difficult to lay down any definite rules for painting procedure.

Most building materials contain a certain amount of soluble salts, but usually the quantity is so small that under normal conditions only a slight trace becomes visible at the surface. Plasters themselves, for example, if cast in slabs and allowed to dry, rarely show more than a trace of efflorescence and the British Standard for Gypsum and Anhydrite Building Plasters, B.S.1191 limits the amount of water-soluble matter to 0.1 per cent.

Bricks vary considerably in their content of soluble salts and while the majority contain only a little, bricks from certain localities sometimes contain enough salts to cause a heavy growth of efflorescence and even to disintegrate the bricks themselves. Such bricks, even when plastered, constitute a serious source of danger to decorations.

Salts sometimes find their way into a structure through the use of unwashed sand or of sea water and walls may become contaminated with salts from the manufacturing processes for which the building is used. Apart from these special cases, however, the main trouble from efflorescences arises either when large quantities of water are used in construction or when water is constantly entering the structure from some outside source, e.g., from the ground or from rain. The continual passage of water through a wall to the inner face causes salts to accumulate at the plaster surface and may eventually produce a heavy deposit even when the percentage of salts in the component parts

of the wall is too small to give a perceptible efflorescence in normal circumstances.

In new construction, therefore, the best insurance against efflorescence troubles (and, indeed, most of the other defects I have described) is to take care that no more water than is necessary gets into the walls and, of course, to avoid materials likely to have an abnormally high content of soluble salts. In positions where dry methods of construction can be used, the task of the decorator will be greatly lightened. On the other hand, if circumstances demand the use of highly porous walling blocks or bricks which have to be soaked in water before they can be laid, a correspondingly long period for drying should be allowed before attempting to decorate.

In any case a plastered surface should be examined carefully for signs of efflorescence before starting to paint. If any appreciable deposit of salts is discovered, the wisest course is to brush away the growth and leave the surface unpainted for a few more days to see if any more salts appear. Painting should be deferred until the growth ceases. Attempts to stop the growth by means of sealers or primers are seldom successful unless the wall is already practically dry and there is nothing at all to be gained by treating the plaster with acids or other solutions—they are more likely to aggravate the trouble.

FIG. 7. *Example of distemper failing on a concrete column but unaffected on adjacent plastered panels, due to moisture condensing preferentially on the more massive parts of the structure.*

Occasionally, the application of a water paint to plaster or brickwork has been known to start a growth of efflorescence where none was visible previously. It might then seem as if the water paint itself had introduced the salts, but this is unlikely. It is much more probable that the salts had already accumulated in the pores of the material just below the surface (and so were invisible); the application of the water paint wetted and redissolved the salts and also created a new surface of different pore structure from the original, such that the salts were drawn to the surface and crystallised on it instead of beneath it. This effect could probably be prevented by priming the surface with a thin coat of oil paint before distempering.

Organic Growths

As a final example of effects which may arise due to damp conditions I will refer briefly to the disfiguration of paintwork which is produced by the action of living organisms such as algae, moulds and bacteria. These effects are not confined to plastered surfaces nor, for that matter, to paints. Almost any type of surface can become mildewed—textiles, leather, paper and wood, of course, but also less likely materials such as brick, stone and plaster. Mould spores are present everywhere in the atmosphere, and it only requires the right conditions—and that means, for the most part, a sufficient degree of humidity and a suitable medium—to start a prolific growth. Wallpaper, glue and paste are excellent media. So are distempers, unless they contain suitable antiseptics, and moulds will grow quite readily in or on many oil paints. When they do, they form unsightly coloured blotches. The green stain or slime which is often seen on old exterior brick or stone surfaces is due to a rather different form of living organism—algae—the cells of which contain chlorophyll like ordinary vegetation.

The only really effective prevention or cure is to get rid of the damp conditions, but algae can be killed fairly easily by applying a weak ammoniacal solution of copper carbonate. Many moulds can be killed by a weak solution of mercury compounds, but these are rather dangerous to employ because of their poisonous nature. Also, a solution or wash will not penetrate into paint which has become infected, so this must be removed. The surface underneath can then be sterilised by means of a 1 per cent. solution of Santobrite or Shirlan N.A. Sometimes it may be advisable to use a special fungicidal paint for redecorating. A recent report from New Zealand‡ states that mould growth on distemper or wallpaper is inhibited by incorporating 2 per cent. of sodium pentachlorphenate in the distemper or paste.

I mentioned bacteria because I happen to have come across one interesting case of blackening of paint due to bacterial action. A new building in the country had been built in a well-known type of brick and plastered with a widely-used type of gypsum plaster and was painted with a cream coloured high-gloss paint. In places this very soon turned quite black and this continued to occur even when three or four further coats of paint were applied.

The blackening might conceivably have been caused by some local atmospheric pollution but after investigation this possibility was ruled out.

To cut a long story short, the trouble was eventually traced to the action of sulphate-reducing bacteria which were present in the sand used in the construction of the walls. The characteristic of these bacteria is that they reduce sulphates such as the calcium sulphate of the plaster and emit hydrogen sulphide gas and it was this gas which blackened the paint. In case this explanation appears far-fetched I might add that more than once when I have stored plaster specimens on wet cotton wool in a damp underground room the plaster and cotton wool have become blackened in this way and smelled strongly of hydrogen sulphide.

Summary

To sum up, it is points such as those I have mentioned which will be taken into account in framing the recommendations for

‡N.Z.J. Sci. Tech., B. Gen. Sect.; *26* (4) 174. Jan., 1945.

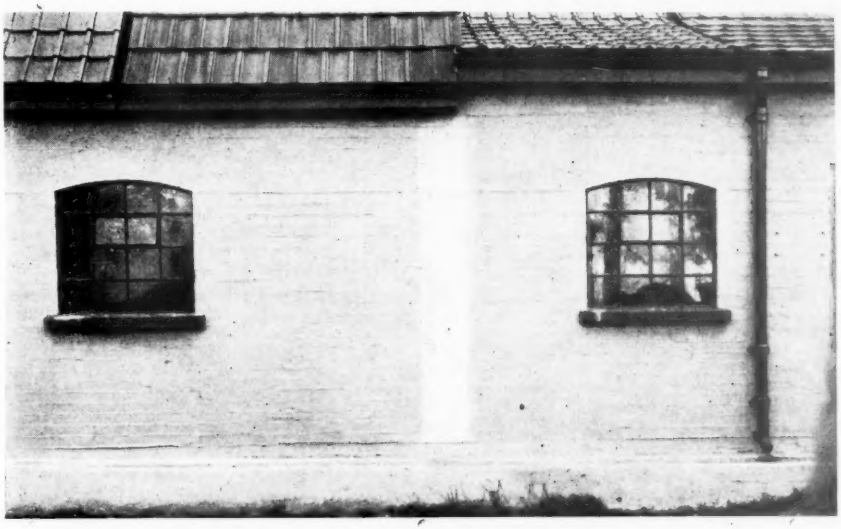


FIG. 8. *A different and more exceptional example of preferential condensation. The wall was warm until the weather changed suddenly; moisture then condensed, at first only on the thinner parts of the wall (see text).*

the Codes of Practice for painting plaster. And although I may have been at pains to call attention to all the worst things which can happen in this line of work I have not meant to be discouraging but rather the contrary, by showing that the main pitfalls can be avoided, provided their nature is understood. If I were asked to name only one item which would help to save disappointment with the decorations, I think I should say—try to persuade the client not to insist on having a high-gloss finish straight away on his new plasterwork.

You will have gathered, also, that much can be done, where a high-quality decorative finish is required, by designing the building in such a way as to make things as easy as may be for the decorator, for example, by avoiding salty bricks, and walls which have to be built very wet and plasters which will tend to saponify paint or suffer from delayed expansion. Or again, by doing all that is possible to keep the work and material protected from the weather during construction, so that the decorator is not asked to cope with walls which are virtually waterlogged. Also, let the decorator be given full information about the construction, materials and history of the surfaces with which he will have to deal.

In the painting work itself the main precautions to be taken fall under the headings of ample drying time (coupled with adequate ventilation of rooms), the use of porous coatings until drying is complete, the use of alkali-resistant primers and pigments on lime plaster and cement surfaces, and avoidance of too rapid drying of Keene's and similar types of plaster.

DISCUSSION

MR. W. J. B. CLARK, F.I.B.D. (Director of Messrs. Clark & Fenn, Ltd.), said he felt that the difficulties and dangers of priming and painting plaster work had been rather over-stressed. It was true that all buildings to-day were erected for immediate occupation, with the result that by the time the plasterer arrived the job was well behind, and it was much more so when the decorator came on to the scene. He believed that gypsum plasters, i.e., calcium sulphate plasters, which were generally called in the trade "hardwall" plasters, were almost 100 per cent. free from alkalinity. Therefore if they were used as a backing, in conjunction with a good clean washed sand, and then the finishing was used as it should be normally, i.e., not adulterated with some form of lime, on the ground either of economy or of speeding the work, he was satisfied that there was no risk in attempting to paint, even with a high gloss paint, if a certain amount of the moisture content was allowed to evaporate out of the plaster work. In the south it had been the general practice for the last fifty years to use gypsum-type plasters on a backing of Portland cement and sand, and he suggested that a great deal of the trouble that was experienced with efflorescence was due to the Portland cement. If, however, it was intended to use a lime plaster, which he considered to be the finest type of plaster, an oil paint could not be used until the moisture content had been reduced to almost nil.

With regard to Keene's cement, he had always adopted the "brush to follow the trowel" principle. He had a slightly different theory from the lecturer's on this point. It was known that plaster set by resuming its normal crystalline structure, and that, when a sharp colour was applied while the plaster was wet, it penetrated before the crystals had completely set and thereby attained a really good adhesion. He thought it would surprise the lecturer to know that he had never hesitated to start undercoating within twenty-four hours, and he could show many jobs where Keene's cement had been so used and decorated successfully even with a high gloss or an enamel paint. He thought that Keene's cement had been invented about a hundred years ago for the specific purpose of enabling a wall to be papered or painted immediately.

He understood that the lecturer was opposed to the use of muriatic or acetic acid for the removal of efflorescence crystals when they were present. He would like to know whether the lecturer had any views on the use of aluminium paint with some sort of wood oil as a primer, also whether he approved the use of the spray for priming purposes.

He would recommend the architect always to advise the plasterer well in advance when he intended to use an oil paint or some sort of special decorative finish. The first or priming coat was obviously the foundation of the paint film and therefore needed careful consideration.

He wished to thank the Architectural Science Board for inviting members of the Institute of British Decorators to attend the meeting. He hoped they would be invited again on some future occasion.

MR. LLEWELLYN said he realised that the question of priming Keene's was controversial. He was very interested to know that Mr. Clark made a practice of priming following the trowel and then applying an undercoat within twenty-four hours. If Mr. Clark had never experienced any trouble through doing that, he must be more fortunate than a number of people whose jobs he himself had inspected, but he thought a great deal depended on the moisture content of the backing. As far as the plaster itself was concerned, there was no reason why Mr. Clark's practice should not be adopted. The trouble occurred when the backing was extremely wet.

He regarded the use of acids for removing efflorescence as being

unnecessarily drastic. Acid treatment was useful for removing the laitance from Portland cement, but the salts commonly found in efflorescence could be removed with water or by brushing.

He would be interested to experiment with aluminium paint as a primer for plaster. He thought that while it might be suitable for gypsum plaster, there was a risk that alkaline plasters, such as lime plaster or Portland cement, might attack the aluminium pigment, with the evolution of hydrogen.

The use of the spray for priming purposes had been discussed at some length by the Paint Study Committee and the general consensus of opinion appeared to be that, whereas the other coats could be very usefully sprayed on, it was better to apply the primer by brush. There was, however, the alternative of spraying on the primer and then brushing it into the surface in order to ensure good contact.

MR. A. ANDREWS said he agreed with the lecturer that Mr. Clark had been extremely fortunate if he had not experienced trouble in immediately applying an undercoat on Keene's. Speaking with over fifty years' experience, he could see no benefit whatever in following the trowel with the brush or with a sharp colour. The essence of the whole matter was the point which the lecturer had raised, namely, that it was no use whatever attempting to do any finish decoration until the groundwork was thoroughly dry.

He had been very interested in the lecturer's tabulated statement on the question of porosity and adhesive power. On various occasions he had experienced lack of adhesion through a too-highly trowelled finish to plaster surfaces, and he wondered whether the lecturer had had any experience of that. It had engendered a condensation which, in his experience, had materially affected the adhesive power of paint.

With regard to fungoid growths, he would like to know whether any experiments had been made with intermixing D.D.T. with the material make-up of a paint for the purpose of destroying such growths.

MR. LLEWELLYN, referring to the question of paint failing to adhere to polished surfaces, said he always felt there must be some other cause of the failure to adhere, apart from the mere fact that the surface was polished, because there was no difficulty in demonstrating that oil paint would adhere perfectly well to a polished plaster or other polished surfaces. He agreed, however, that in practice paint sometimes did come off plasters which were highly polished, and he thought he had given part of the reason for that in his lecture. The measurements which he had quoted had shown that the denser the plaster, the stronger the adhesion, provided that the plaster was dry, but, if there was any dampness coming up from the back, the paint lost more of its adhesion on a dense plaster than it did on a porous one, into which it had been able to penetrate. Moreover, on the polished surfaces of some dense plasters fine traces of efflorescence sometimes appeared, which interfered with adhesion.

Experiments were being made on the incorporation of D.D.T. into distempers and, he believed, into oil paints, but he did not think there was any question of it having a fungicidal or bactericidal action. The object was merely to supply a surface which would be lethal to flies and other insects.

MR. FALKINER NUTTALL said that with the introduction of wall work done off the site, plaster was often cast on glass, and he would like to hear the lecturer's views with regard to adhesion on such surfaces.

MR. LLEWELLYN said he had not seen the type of unit in question but in his own experiments the paint had often been applied to plaster surfaces cast on glass. In general, the adhesion was much the same as on the trowelled surface and varied with the porosity of the plaster in the way he had shown. The adhesion of paint to the walling units would therefore depend mainly on the type of plaster used.

MR. GRENFELL BAINES, referring to the lecturer's statement that blue was a colour affected by alkalis, said he had recently read a paper before the Oil and Colour Chemists' Association in Manchester, and, as architects seemed to be rather fond of blue, he had made a plea for a more durable blue. He had thereupon been asked whether he had not heard of Monastral blue and had been assured that it was absolutely fast and reliable in all circumstances. He would like to know whether the lecturer could confirm that.

With regard to the little machine for determining humidity which the lecturer had shown on the screen, he had noticed that it was mounted on a stand, and that probably fixed the height at which the humidity was determined. Surfaces did not dry out evenly, and he would like to know whether the figures obtained at the height in question were applicable to the whole of the wall.

A method had been devised for hastening the drying of plaster by blowing hot air on to it, and he would like to know whether the lecturer had had any experience of that and whether he thought it worth pursuing.

MR. LLEWELLYN said that while he had not himself tried out a paint based on Monastral blue, he thought it was fairly well known to be a highly fast pigment. The danger of blue fading referred particularly to Prussian blue and to Brunswick green, which was based on Prussian blue and chrome yellow.

With regard to the moisture meter, Mr. Baines was right in thinking that it gave the moisture content at the particular point where it was placed, and he had not tried exploring over a very large wall to find out what the variation was. He would expect the results to vary appreciably from the bottom to the top of a wall, and in any case a great deal would depend on the air circulation into the room. He had not put the instrument forward as giving a complete answer to all the decorator's problems but simply as one which had given some interesting results and had considerable potentialities.

He had not had any direct personal experience of the effect of forced drying on plaster, but one of the dangers was that of delayed expansion, which he had illustrated. Keene's or plasters of that type could very easily be dried out too quickly, but if the drying did not extend right through the wall the moisture might come back later on and cause delayed expansion. In the case of other types of plaster he did not see why forced drying should not be used.

MR. S. N. BARRON said he realised that the lecturer had been referring to adhesion on new plaster work, but to-day a great deal of repair work was being done and one saw regrettable examples of failure to adhere. He had in mind particularly the flaking of distemper from the surfaces, and he would like to know whether the lecturer had any suggestions to make for aiding the removal of a coat of distemper, part of which had flaked and peeled off. It all had to come off. The problem was often a matter of thorough workmanship, but it was difficult to get the surface thoroughly scraped and washed down to-day ; if there was some rapid method of removing the faulty work it would be a great help in getting another coat of perhaps more suitable material into position.

MR. LLEWELLYN said he was familiar with the difficulty to which Mr. Barron had referred but he was afraid he did not know of any material which would remove the distemper easily and cheaply. It often happened that, when everything possible had been done to wash and scrape the distemper off and the wall had been allowed to dry out again, some more of the distemper came away when a new coat was being applied. He believed that the accepted method of overcoming the difficulty was to remove as much of the distemper as possible by every available means and then to let the surface dry out, and then, before applying a fresh coat of distemper, to apply a thin coat of oil paint which would penetrate the old distemper and bind it back to the wall.

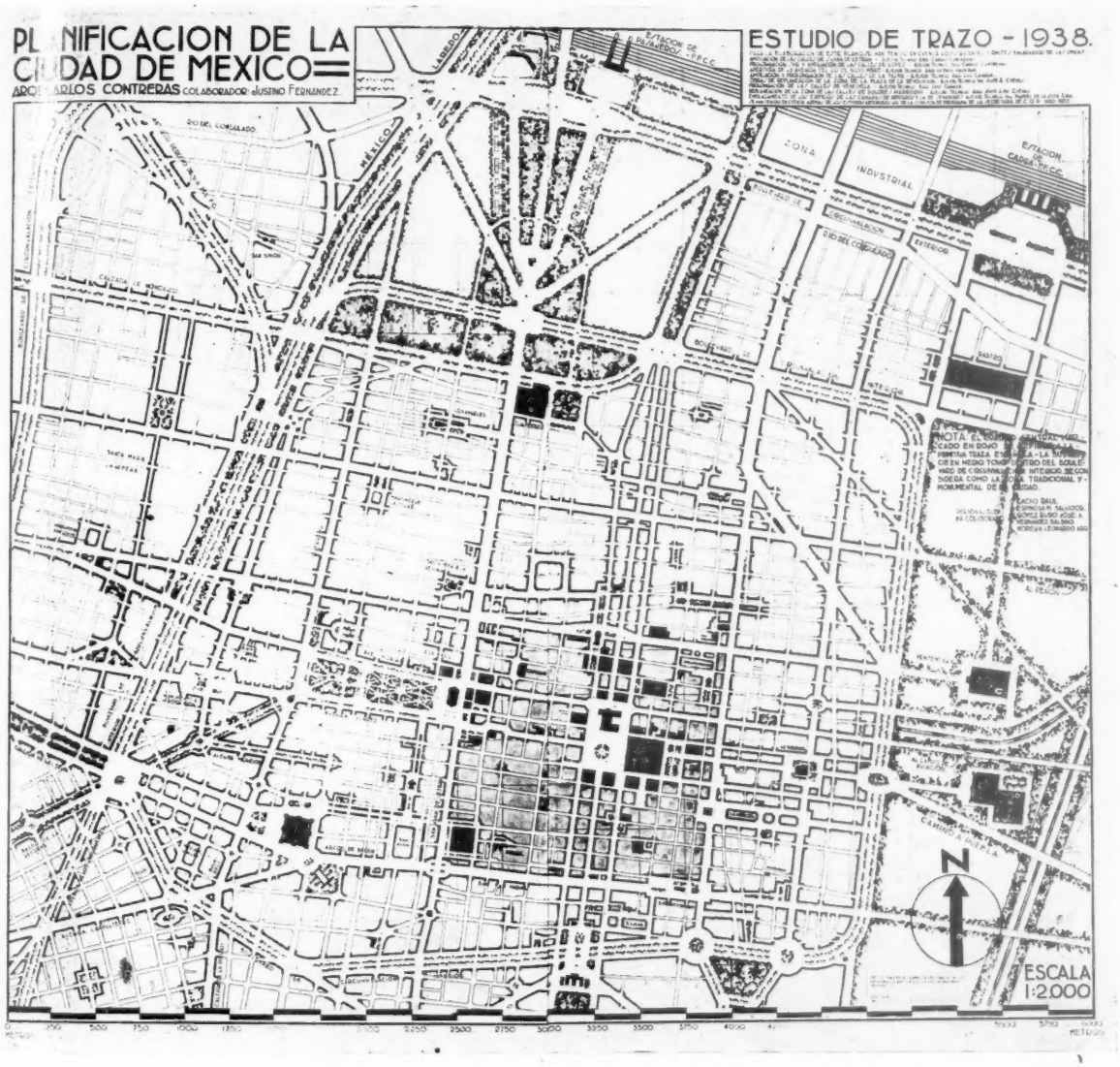
MR. W. A. ALLEN said he was under the impression that in America one saw fewer decoration failures than in this country, and he would like to know whether Mr. Llewellyn, who had recently been in America, could make any observations on that subject.

MR. LLEWELLYN said that when he was in America he had not met anyone who was an expert on the painting of plaster. If there were fewer decoration failures in America, it might be due to the fact that there were far fewer varieties of plaster in use in that country and the ones which were used were generally of the hemihydrate type, which always seemed to him to be the type least liable to give trouble. He had, however, seen American publications which described very much the same sort of effects as he had mentioned in his lecture in the matter of chemical attack, such as saponification. Those publications were not very recent ones, and it might be that the Americans had now got a more standardised procedure and a standardised type of plaster and had overcome their teething troubles.

The CHAIRMAN asked whether Mr. Clark would like to say anything more on the question of the brush following the trowel.

MR. W. J. B. CLARK said that he did not normally of his own free will adopt the procedure he had mentioned. He had been referring in particular to a vast amount of painting work which his firm had done before the war, in connection with cinemas. The financier concerned had cared about only one thing, namely, how soon the box office could be opened, and he had been told : " We can do your work much more quickly if you will pay for Keene's cement, because then we know that we are quite safe in decorating straight away." While a good deal of the work had been finished in flat oil paint, which gave no trouble, thousands of yards of dadoes throughout the country had been given a high gloss or glazed finish.

On the motion of the chairman, a vote of thanks was accorded to the lecturer, and the meeting then terminated.



Town plan of the centre of Mexico City. Many of the new streets shown have been cut

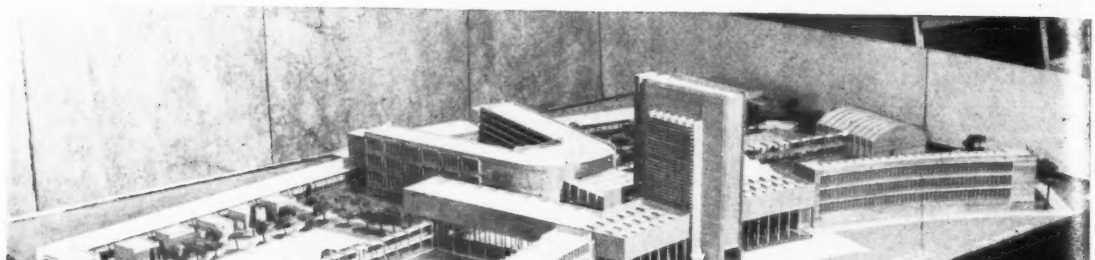
MEXICAN ARCHITECTURE AND TOWN PLANNING

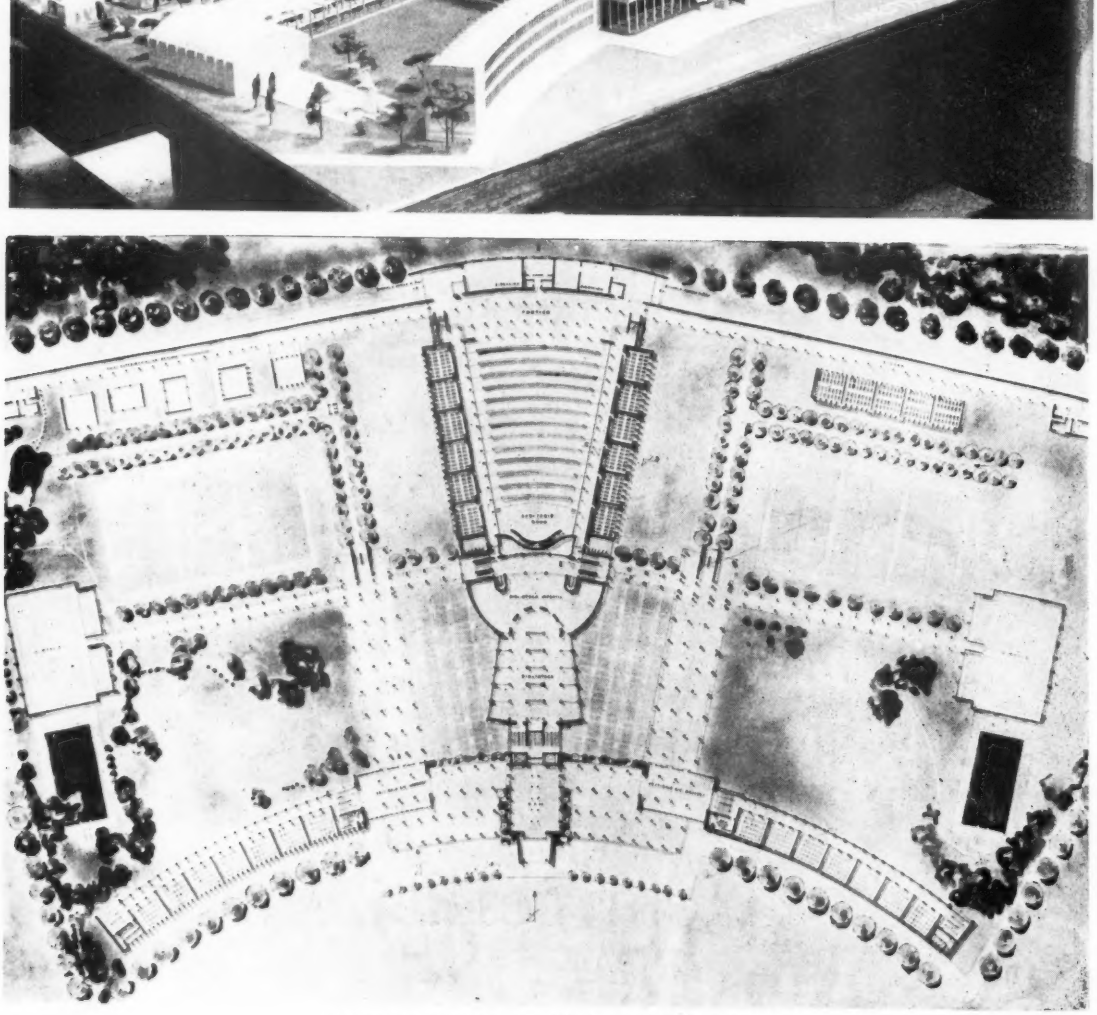
A Lecture by Senor Don Carlos Contreras, President of the National Association of Town Planning of Mexico, at a Special Meeting on Tuesday, 19 February. Mr. G. L. Pepler, C.B. [*Hon. A.*], in the chair

The chairman said that in Mexico Señor Contreras *was* town planning. He was President of the National Association of Town Planning. He also had close ties with Great Britain as Honorary Corresponding Member of the Town Planning Institute. Those who had attended the 1938 conference in Mexico of the International Federation for Housing and Town Planning would have appreciated the tremendous influence that Señor Contreras exercised in his country.

After a few opening general remarks Señor Contreras showed a large number of slides and gave a running commentary on them. A typical selection is here reproduced. It was difficult, he said, to give anything like a full picture of Mexican architecture and town planning in a single lecture. He would not refer to architecture before the Conquest nor to the three centuries of the Colonial Period, although their architecture was remarkably interesting. He would confine his attention to the last ten or fifteen years and the work of the younger architects.

In the field of town planning there had been many ups and





Model and plan of a large school project in Mexico

downs, but things were now moving very fast. In fact they were almost too fast. Things were sometimes now done without being properly studied, which meant quick decisions, and such decisions might be dangerous. Nevertheless they were making great progress in replanning four or five of the important cities, notably the important seaport of Acapulco and Mexico City itself.

He described the town plan of Mexico City (page 175). The dark portion in the centre was the original Colonial city through which some wide streets were being cut. Large parts of the main ring road, as well as several traffic arteries, had been executed and work was proceeding on a large scale. He showed a perspective (page 177) of a typical piece of planning involving realignment of streets and the creation of a *place*, fronted partly with old buildings and partly with new buildings and leaving an ancient church as an island in the centre.

An important factor in building in Mexico City was the nature of the subsoil. Practically the whole of the city was built on old lake beds, the bottom of which consisted of volcanic ash and water. This formed a soft clay with a water content as high as 85 per cent. Samples of the subsoil exposed to the air shrunk

to a small proportion of their original size in a few days. Earthquakes were another problem. An imaginative friend of his had described a large corner building in the last earthquake as practically gyrating! The building had had to be pushed back into shape with hydraulic presses and all the beams and uprights reinforced. In many parts of the old city, large buildings had a mellow curve because they had sunk unevenly. Subsidences might be as much as six inches, but they stood up because of the elasticity of the subsoil and the use of strong materials such as volcanic rock.

Señor Contreras then went on to describe the work of school building which had been fostered by the Department of Education. He showed pictures of some of the larger school projects and, in contrast, some of village schools. These were often practically in the open air, being built of closely spaced bamboo poles and roofed with thatch (page 178).

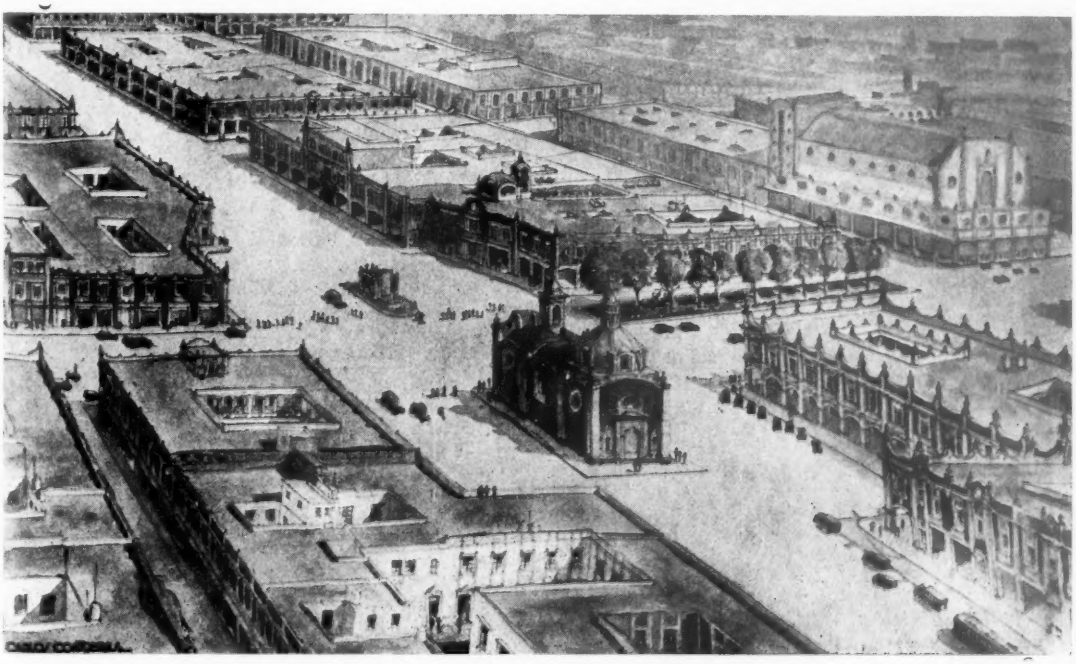
The work on hospitals was remarkable. For this the Department of Public Health and Social Welfare was responsible. It had the wholehearted support of the President of Mexico, while the head of the Department, Dr. Baz, himself a prominent surgeon, had succeeded in obtaining the support and co-operation of all parties; he had been particularly successful in bringing the architects and doctors together. At one time hospitals had been planned by doctors. Now there was a special panel of fifteen architects and fifteen doctors who discussed the problems of hospital construction and planning and decided building programmes. Many of these hospitals were built in country areas and had to make use of local materials and crafts.

In answer to questions Señor Contreras said that those architects who had striven to preserve a certain interest in the traditional architecture of Mexico had been rather defeated by the younger generation and generally he was glad to acknowledge that fact. It was also easier to build in reinforced concrete than to use masonry. But he felt that they ought not to lose sight of the Mexican tradition of scale, proportion, and the use of colour. The modern architects recognised this, though he felt that more could be done.

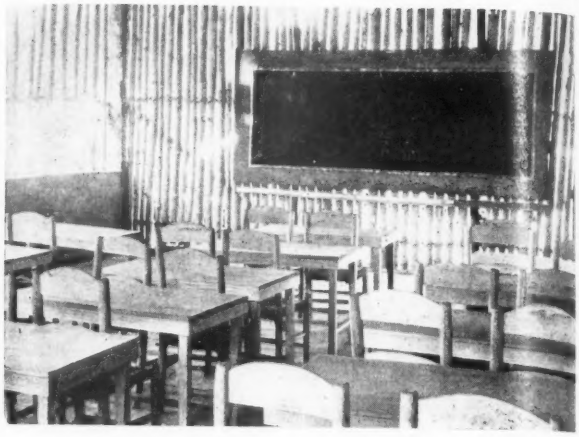
Street improvement schemes were financed by co-operation between property owners and the city authorities. Sometimes owners in adjacent streets were brought in by means of special taxation. Generally half was paid by the city and half by the owners proportionately to the assessed value of each property. However, the natural rise in property value always paid for the improvement in the course of time. In one case an accrued value of £150,000 was anticipated, but it had actually been ten times that sum over the length of one mile. He found that if a property owner received more than he had been led to expect there was no difficulty!

In answer to a criticism of the great size of some of the hospital schemes, Señor Contreras said that the Government's policy was directed towards future rather than present needs. He did agree, however, that a policy of smaller and more numerous units might be preferable. He thought too that there was a tendency to excessive height. It should be realised, however, that these hospitals covered large areas of population.

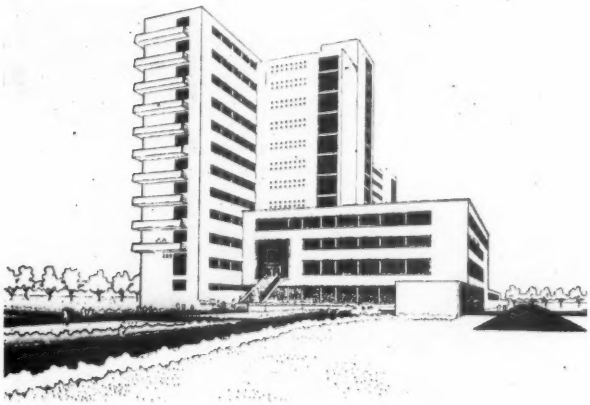
The ancient church incorporated in the scheme below.



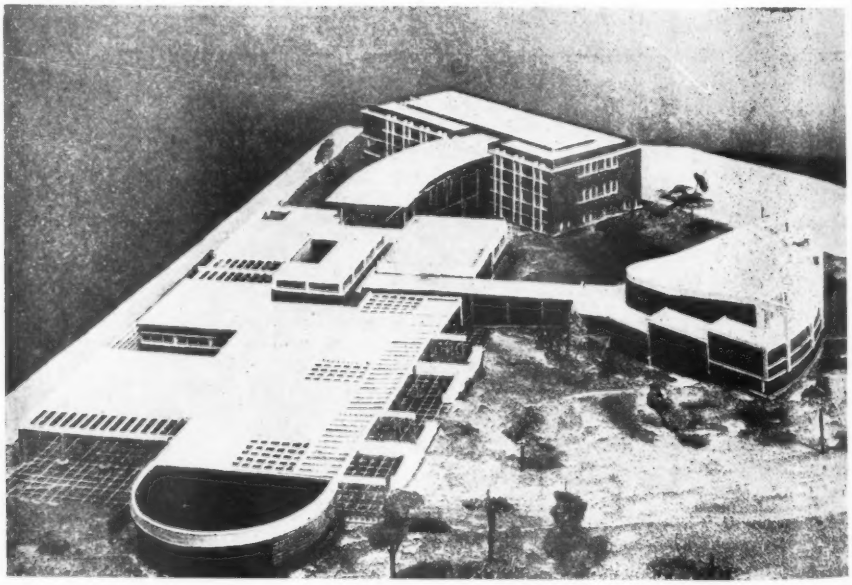
Perspective of a replanned portion of Mexico City.



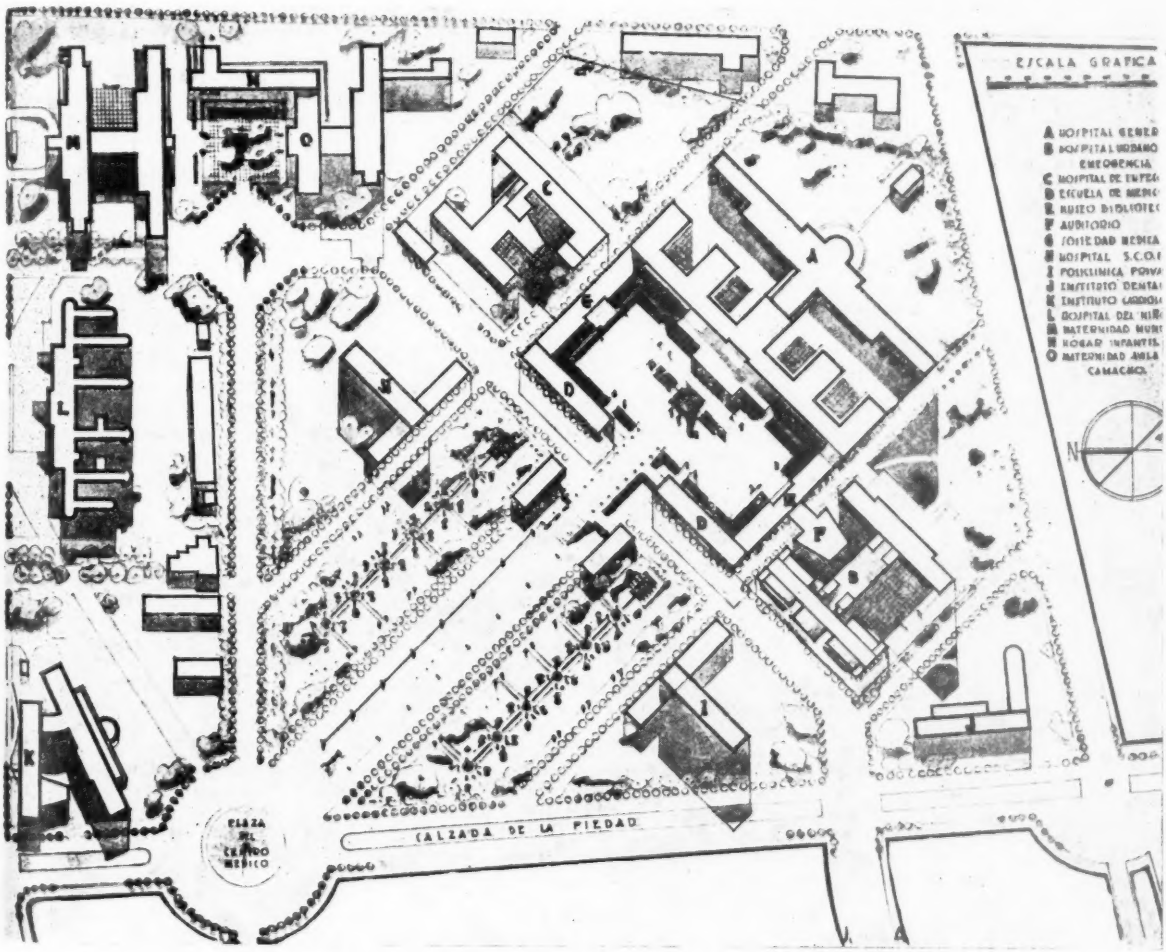
Top left and above : The exterior and interior of a typical village school of open-spaced bamboo poles as walls and a thatched roof.



Perspective of a hospital project.



Model of a large school project.



The principal hospital centre of Mexico City incorporating general, casualty, maternity and children's hospitals, medical school, dental institution, medical library and other associated medical buildings.

TOWN AND COUNTRY PLANNING

ADDRESS TO THE COUNCIL BY MR. F. MARSHALL, M.P., PARLIAMENTARY SECRETARY TO THE MINISTRY OF TOWN AND COUNTRY PLANNING ON 12 FEBRUARY, 1946

THE PRESIDENT IN THE CHAIR

THE PRESIDENT: Unfortunately the Minister is suffering from influenza, so he cannot be here to-day, but we are glad to welcome Mr. Marshall, Parliamentary Secretary to the Ministry of Town and Country Planning. I will ask Mr. Marshall to say a few words to us on the policy of his department as it affects architects.

MR. F. MARSHALL, M.P.: "In the first place, I should like to congratulate you, Sir Percy, on your knighthood. It is a tribute well deserved, and I sincerely hope that you will live many years to enjoy it.

"I have had to undertake this function at very short notice, but I regard it as a very great honour, gentlemen, to be able to say a few words to you about the work of our Ministry. The Ministry of Town and Country Planning is a comparatively new institution, and I should like to pay my tribute to those very earnest men and women who for many years past have been pressing upon the country the need for planning, for the preservation of beauty, and—may I say?—for the improvement of architectural elevations. It was my good fortune to sit on the Council of a great county borough in this country, and in the course of time I became chairman of the Plans Committee of that county borough. While I had very little technical knowledge of architecture, or even plans, I very soon felt that the plans that were coming forward needed very great improvement, not only from the point of view of elevations, but also from the point of view of site, so I can say that my mental evolution took place through observation and experience. I ultimately became chairman of the Town Planning Committee of the city and took some part in getting out its pre-war plan. Since then, the war has widened the opportunities for the planning of that city, as it has done in the case of many other cities, and it seems to me that now this country has the greatest opportunity it has ever had to embark upon a reconstruction policy which will give it the buildings and planning that it needs, which we all believe will result in a far better Britain than that of the past. I have said, and I still believe, that we are at the beginning of a new era, not only with regard to physical reconstruction but also in social matters. Perhaps it will never again fall to the lot of any people to have the opportunity of refashioning some of their towns and cities almost completely, which is the position to-day.

"All kinds of buildings are needed, from cathedrals, churches and State buildings down to the humblest dwellings of the poor, and it seems to me, therefore, that the architects' profession has a very vital part to play in this great problem of reconstruction. Whether the result be good or bad, the details of this vast undertaking will be conceived in the imaginations and the minds of the architects of this country, and for the next hundred years people will be looking at the shape and fashion given to the physical aspect of our communities to-day. Therefore it is not possible for me to over-emphasise the importance of the part which architects have to play in this vast undertaking. As one who in his early days browsed upon the works of John Ruskin and William Morris, I am nothing if not an idealist, and I am hoping for the best. I am quite sure, from my experience of local authorities, that the desire to do the best is there. The question arises whether we have the will to carry out this great undertaking.

"Both the Minister and I are very keen about this matter. We want to see a Britain arise that will be worthy of a great people, and that can be done only by a great co-ordinated effort. I do not regard our Ministry as just a Ministry for the preservation of amenities; it has many more duties than that. I used to have an idea in the old days that we could possibly get a Town Planning Ministry and induce it to create a great master plan of the country, indicating the places where development could take place; but as time goes on, I feel that would not be a wise policy to adopt, even if it were possible. Any plan of national development must be an ever-changing document, needing modification as new needs and circumstances arise, and if there is an adequate power of control during the evolution of these ideas, I feel sure that we shall get the country we desire.

"One of our difficulties hitherto has been that we have not had planning legislation to adequately cover all we wanted, and when the Ministry of Town and Country Planning was set up, it was soon recognised that many local authorities, from the planning point of view, had been very backward. As a matter of fact, they had not passed the necessary resolution which represents the first stage in obtaining control over their particular areas. That was remedied in 1943, when the Interim Development Bill was passed, which brought the whole country under Interim Development Control. There was one clause in that Bill which I always felt was very vital. You will probably remember that, under the Act of 1932, if an applicant sent in a plan for development and the local authority did not decide on it within two months, the application was deemed to have been granted. In the Act of 1943 we reversed that process. If an application is sent in now and the local authority does not decide on it within two months, that application is deemed to have been refused. That reversal has the effect of preventing misplaced development taking place in default of the local authority.

"A second great measure was the Town and Country Planning Act of 1944, which is mainly designed for dealing with the reconstruction areas in the blitzed towns. It may be that when we have had experience of this measure, we shall find that certain amendments are necessary. The Act gives substantial financial help to local authorities which can, under its provisions, extend over a period of fifteen years. It is very natural that, faced with such gigantic reconstruction tasks, the local authorities should question the adequacy of the financial aid, but I think we have to give the 1944 Act an opportunity to work. If we then find that amendments are necessary, the Town and Country Planning Ministry will have to face up to that very important task.

"I wish to pay my tribute here to the many architects who have done magnificent work in the preparation of the plans for the blitzed towns. I was delighted last week to see the great scheme that the London County Council has put forward, a scheme that will cost many millions of pounds, and I pay a tribute to their boldness and courage in bringing a scheme like that forward. I understand that Plymouth is now on the point of making application for a Declaratory Order under the 1944 Act, which means that it has a bold scheme with considerable financial implications. I know the anxiety which the public representatives of Plymouth have felt in this connection, but they have now come to a conclusion on the matter. West Ham, again, is in much the same position as Plymouth. These authorities have 'grasped the nettle' and they go forward with our best wishes. I am quite sure that your profession has played a very important part in the preparation and the co-ordination of these schemes of redevelopment, and personally I am very pleased about it. After all, planning is not just a matter for one department, either locally or nationally. All kinds of considerations are involved. The location of industry, the size of towns, the question of amenities, and so forth, must all be balanced and brought into accord and harmony by the genius of the town planner, the architect and whoever has to do with the making of the plans. I believe that the provisions of the 1944 Act will give us a basis upon which to judge what is really needed for the rebuilding of our country on seemly and proper lines.

"Anyone who has been interested in this matter knows that one of the greatest obstacles to planning has been the lack of a proper system of compensation and betterment. Local authorities have been practically held up to ransom on account of the very heavy charges for compensation that have been demanded from them when they wished to purchase land for public amenities and uses. That kind of thing has got to cease. Unless we can clear away this threat of very heavy claims for compensation from the minds of local authorities, there can be no proper planning in this country. If that is not done, obviously development will take place on the cheapest sites, which are not always the best. I am sure that both architects and the Ministry would like to see our towns rebuilt in accordance with the best planning principles, but that cannot be achieved unless we can once and for ever solve this difficult problem of compensation and betterment. I am hoping that the Bill will be introduced somewhere about late spring. I cannot, of course, tell you what is in it, but I think you will find when it is published that it deals with this question in a bold and courageous way and will give planning authorities an opportunity to plan without the fear of heavy claims for compensation hanging over their heads.

"You will see, therefore, that the Ministry is gradually forging a great planning instrument, and I hope that by the end of next year we shall have a code of legislation that will serve us well for all purposes.

"With regard to national parks, we shall probably be introducing legislation at no distant date. As you know, the Hobhouse Committee is considering this problem and I hope their report will give us some indication of the special administrative problems raised by this question. I feel sure that when we are in possession of the Report of that Committee we shall be ready for legislation, and both the Minister and I are anxious that legislation on this matter should be introduced at the earliest opportunity.

"As to the question of satellite towns, here again there is a glorious opportunity for the architects. There have not been many opportunities in this country for an architect or a group of architects to plan a completely new town, but that opportunity is coming, and I shall be fascinated to see how the experiment goes. It will give the architect the greatest possible scope because all the buildings in a new town will need to be designed by the architectural profession. I hope that, when the new towns are finally completed, they will be worthy of a great country and of the architectural profession.

"When we think about new towns, we see that all kinds of questions arise for consideration. In the first place, they are nobody's baby. They do not fit into the structure of local government that has been growing up in this country during the last 150 years, and consequently we may have to appoint a foster-mother to arrange for their growth and to lead them gradually into the general system of local government. You will see at once that special administrative problems are raised, and it may be necessary to strengthen our hands by new legislation. Lord Reith's Committee is considering the matter, and I feel sure that it will not be long before his Lordship, with his wonted energy, acquaints us with all the difficulties facing us.

"I have tried to show you our intention and give you some indication of the instrument we are forging to essay this very great task. Both the Minister and I have had some experience of local government and have taken a very great interest in planning, and I am quite sure that we should both agree that the architects have a very important function to perform in this great work of reconstruction. If I know the architects aright and the distinguished men that they have produced in this country, I am sure that they will make no mean contribution to the creation of a better Britain."

THE PRESIDENT: Mr. Marshall has promised to devote a few minutes to answering questions.

MR. FRANK H. JONES [*F.*]: I should like to ask Mr. Marshall why, if it is possible to get three or four times the value of the land, the Local Valuation Department will allow only March 1939 price.?

MR. MARSHALL: The relation of the purchase of land to the 1939 values is a Cabinet policy. It was adopted by the Coalition Government, and the present Government has adopted the same principle. The 1939 values were imposed because neither the Coalition Government nor the present Government wanted people to get rich out of the war effort. In short, it was felt that all the values that had accrued to the land as a consequence of war effort should come back to the State and should not go to the individual, and I think on the whole you would agree that, when everybody has made such enormous sacrifices during the war, it is a fair policy that no one should be allowed to get rich out of the accrued values of land that resulted from the war.

MR. CHARLES OLIVER [*L.*]: I should like to ask Mr. Marshall whether the Minister would give favourable consideration to the Council of an urban district of, say, 30,000 or 35,000 inhabitants becoming its own town planning authority, to enable it to get on with the work.

MR. MARSHALL: There are well over 1,000 town planning authorities in the country, and my experience suggests that where every urban district authority does its own planning we do not get the margins covered. Each little authority plans its own area without any necessary relation to the area next to it, and the consequence is that it has been borne in upon us time after time what is needed is for broad areas to be planned as a whole. I think we shall all realise that that is the proper thing to be done. That does not, of course, prevent local authorities having a hand in the matter. They should put forward their views to the Joint Planning Committee which is responsible for the larger area and should see that their views are properly considered. In the London area, for instance, there were no less than 143 planning authorities, each doing its own planning without any necessary relation or collaboration with the other authorities round about. The Minister very soon realised that if he could not boil these 143 authorities down to some manageable number the planning of London would be hopeless chaos, so he boiled them down to about 25 joint committees, and even with 25 joint committees the job will be a pretty difficult one. The Minister then conceived the idea that out of these 25 joint committees there should be formed an advisory committee, and that advisory committee has been appointed. Its duty will be to deal with the great plan for the whole of the Greater London area, designed by Professor Sir Patrick Abercrombie. It seems to me that that is the only way in which the country can be covered effectively.

Let me give you one illustration out of my own experience. I wanted to preserve a very beautiful amenity on the western side of Sheffield. It has historical associations, and from a landscape point of view it is a perfectly lovely area. Unfortunately for us, part of it was in the area of a rural district council which was its own planning authority. I caused a protest to be made to that council, and we were told straight away: "Well, it is your baby. We have nothing to do with it. If you want to preserve it, buy it. We are not interested." One cannot do planning under conditions like that. The consequence was we had to take other measures to preserve the area, whereas if there had been a joint committee for the whole area it could have been done as one unit, irrespective of whether the area in question overflowed into this area or that.

Therefore I think it is a perfectly good policy to boil down these independent small committees and to convert them into joint committees for larger areas, on which the local people will have representatives, who will be able to make the interests of their own districts felt. I think that is the only way in which we can get the country effectively planned.

MR. CHARLES OLIVER [*L.*]: That is so, of course, if the smaller authority does become in fact a living partner in the major scheme, but I am speaking as the representative of a planning authority where such is not the case.

MR. T. M. ALEXANDER [*F.*]: I welcome the views expressed by Mr. Marshall and particularly his approval of the work of the architect in regard to town planning, and I should like to express the hope that in pending legislation the Minister will be persuaded to ensure that the architect who may be called upon to

deal with the development will be called into consultation with regard to town planning schemes at the earliest possible moment. I have in mind certain very large local authorities where the official responsible for the preparation of the town planning scheme is not an architect, although the local authority employs a city architect. My view is that if the architect is not called in at the beginning there may be a distinct loss to the development. I am sure Mr. Marshall will note with some satisfaction that members of our profession have already played a notable part in some of the very large schemes to which reference has been made, and I feel it would be a distinct loss to the country if their collaboration was not secured at the earliest possible moment.

MR. MARSHALL : I quite agree and, as far as I am concerned, you are speaking to the converted. In my administration of the Sheffield area we used to have meetings at which the City Architect was present and could put forward his views, and I think that should be done generally. I have said and I sincerely believe that the architect has a very great part to play in this matter. Owing to his experience and the nature of his avocation he is fitted to give advice to planning committees. I know that the Minister if he could have been with you to-day would have answered somewhat as I am answering and would have said that he desired architects to be brought into collaboration at the first opportunity. They have done magnificent work, and it would be a pity if they were left out of this great venture.

MR. D. E. E. GIBSON [*A.*] : Mr. Marshall said, I think, that the Ministry had considered the possibility of having a national plan for the country but had set that aside as being impracticable and were going almost from day to day or month to month to vary the thing, but surely the Ministry must have some national plan. They would not wish, for instance, to vary the plan of the main trunk roads from day to day ; they must know, presumably, where those are going to be, and similarly with regard to the parks and that sort of thing. There is some national plan that the Ministry must have in mind, is not there ?

MR. MARSHALL : Yes. I probably gave a wrong impression about this matter. It is, of course, impossible to lay down all the details of the planning of the country from the centre, but there are such things as roads, airfields, mineral extractions and so forth, which would have to be plotted on a plan. I think it would be an impossible task to put everything into apple-pie order, as we say in Yorkshire, and place it before you. I think actually what will be done is that when local authorities send up their plans—or it may be a little before that—they will be told that certain roads are designed and they will be told about other considerations to which they will have to have regard in preparing their plans. When I said that a plan or scheme of national development would be constantly changing, I did not mean to infer that local authorities, in making their local plans, would not have to have regard to national considerations in regard to the things that I have mentioned, such as roads. They will certainly have to do that.

I may say that I sat on a very important commission not long ago, dealing with the functions of the Ministry, and I heard discussions on the production of a national atlas. I believe something of that sort is in process of preparation now. It will consist of a series of plans which will show all kinds of development, national parks, and so forth, and a geological survey will be included. It will be part of what may be called the working instrument of the Ministry and it will be available, of course, to local authorities when they are preparing their plans.

We are therefore really approaching the idea of a national plan, but I think at the moment it is too early to say that we can get out a complete plan. I think that at the moment we shall have to content ourselves with a statement of principles and an indication of national requirements which will be offered to local authorities in the preparation of their plans and may evolve later into a national plan. There will have to be room for change, of course, because very precious minerals may be found somewhere, for instance, and the policy may change. I think that, if we can indicate these general lines of national development, that is as far as we can go at the moment.

MR. J. RALPH EDWARDS [*F.*] : May I ask whether Mr. Marshall has found that some local authorities are chary about the foundation of a satellite town lest it should impair their own rateable value and whether the Government has in mind any scheme of rating equalisation ?

MR. MARSHALL : I know that the subject of rating equalisation has long been a subject of controversy and that rating equalisation is advocated by some very earnest people, but I cannot say that I know of any scheme which the Government has in mind at the moment. An effort has been made to overcome the difficulty by giving local authorities financial aid for a very long period, in which, of course, they will be reimbursed for any loss in their reconstructions accounts. That is at the moment as far as we can go, I think and, of course, I cannot promise that the Government will bring in legislation for the equalisation of rates, though I can tell you that is a policy in which I have believed for a long time. I do not think it is right that in some places the rates should be very low and that towns in which a great deal of the work of the country is done should be very highly rated. I have held that as an article of faith for a very long time but, of course, I cannot give you any promise that it will be implemented yet.

MR. PHILIP TILDEN [*F.*] : I come from a wild west district where local authorities are few and far between, and I feel it is absolutely essential that those people should have a plan to go by. I think it would cut out an immense amount of red tape if the local authorities knew what the main plan was going to be. If each local authority had at their fingers' ends the small portion of the national plan which applied to them, it would save an immense amount of time and trouble. I know of a case where people were putting up their first houses on a piece of land which I know is going to be taken for the widening of the highway. If each local authority had in their possession the little bit of the national plan that applied to them, they would see what places were scheduled for various purposes, and I think it would save the Ministry and everybody else concerned a great deal of trouble. I only put this forward as a suggestion for these outlying districts. You talk about Sheffield, whereas I am talking about Bodmin Moor and places like that, and I hope you will help us in such places.

MR. MARSHALL : I will, of course, convey to the Minister your views on this matter. Of course, the small local planning authorities will be informed, for instance, of trunk roads ; they will be informed of civil aerodromes, and they will be informed at the earliest possible moment of industrial development in their areas. There is a very close co-ordination on these matters between our Minister and other Ministers concerned. It is too early yet, of course, to get out the complete plan, but I am quite sure that in future local planning authorities will be informed very much more than they have been in the past of any national development that is proposed for their areas.

Again, do not forget that there is in every region a Regional Planning Officer, who will be in possession of the facts, and if the local planning authority would get into touch with that officer he would put them right very quickly, I am sure, on these and allied matters.

So far as the general question is concerned, we shall endeavour as early as possible to acquaint planning authorities of what is proposed of a national character.

THE PRESIDENT : I do not think we should detain Mr. Marshall any longer. He has told us that he has something very important to do to-night.

We are very grateful to you, Sir, for coming here at such short notice and giving us such a lucid address on this subject, which is so vital to architects. I am sure I may express, on behalf of the Council, our thanks to you not only for coming here and addressing us but also for showing us (as I think we have seen to-day) that you at any rate appreciate the great contribution which architects can make to this very important work. We are very grateful indeed to you. (Applause.)

MR. MARSHALL : I thank you, Sir Percy and gentlemen. It has given me great pleasure to come here, and I sincerely hope that in future we shall have very close collaboration with the architects' profession. I am sure the Minister would desire that.

SOUND INSULATION: SOME HISTORICAL NOTES*

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Members of the Staff of the Building Research Station.

Introduction

The problem of sound transmission and its treatment is generally believed to have developed mainly in our own time, but a recent attempt to establish the facts about the early history of sound insulation has disclosed that its roots go much deeper than has been supposed. This note is an account of the findings, which throw some fresh light on building construction practices since the seventeenth century and on certain minor social problems during this period.

Early Practices In Sound Insulation

The earliest written references to sound insulation which have been found are not themselves of great age. In domestic building, the first specific mention appears to be in a Government report on housing dated 1844 (1) where the use of lime-pugged floors is recommended for sound insulation in working-class houses. However, at that time pugged floors had already been in use for at least two centuries and it now seems reasonably certain that in the majority of them sound insulation was a conscious factor in design. Viewed against this background the recommendations of the Committee can be seen to be merely the formalisation and extension of a well-established tradition.

The actual origin of pugged floors is obscured by the years. One early prototype in this country is probably the lime floor which replaced the beaten earth of the early middle ages. Lime floors are still to be found in the country districts of Derbyshire and Northumberland (2) and (3) and but for the depredations of the salt-petre man, many more might remain to show the development of this type (4).

At their simplest, these floors consisted of 3 in. to 4 in. of lime laid on some sort of tray fixed between the floor joists. The lime can hardly have given a good wearing surface, but it was an economy at a time when the imperfections of saws made boarding scarce. Ultimately many of these floors were boarded over and it is in this form that they are shown in Figure 1 (4).

A floor of this sort would effectively limit the transmission of air-borne sound. Probably its reduction factor would be between 40 and 45 db., which is nearly that of modern concrete floors in flats, and by comparison with some other primitive constructions its merit of quiet must have been obvious to local builders of the time. If so, floors like this may have been built where the boarding and lime went in at the same time, the latter merely as a filling for sound insulation; but this remains a conjecture, at least until the time of the 1844 Committee.

Rather clearer evidence of a direct interest in sound insulation among early country builders is provided by floors similar to that shown in Figure 2 (3), which is a contemporary of the other. The boarding is laid upon a mattress of reeds, for which it is difficult to find any purpose other than sound insulation. The reeds would have some quality of resilience, and sandwiched between the boarding and joists they complete a system which corresponds in the main to that of the modern floating floor (6). The semi-discontinuity which resulted would have some merit in respect of both impact and air-borne noise, though it is difficult to estimate values.

This evidence that quiet was valued even in rural districts at these early times, while largely conjectural, is supported by the more positive evidence of urban examples; indeed, if this were not the case, the rural evidence would remain weak in so far as it would be odd to find an amenity of this kind valued in the country and not in the town.

The advantage of studying early structural forms from urban constructions is that they speak their purpose more clearly than those from the countryside. Labour was more skilful and designs were not so closely circumscribed by limitations in materials.

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FIG. 1.—*3 in. to 4 in. lime finished smooth, carried on interlaced hazel twigs: the underside is plastered and a board finish may be added above the lime. Cotswold; 17th century (E. Guy Dawer).*

This was specially true of construction in great buildings such as Hampton Court Palace, and it is from such as these that the best evidence about early sound insulation comes. Consider, for instance, the floor in Figure 3, built under the direction of Wren. In this we find a special layer of boarding (7) put in to carry an intermediate filling which has no conceivable purpose other than

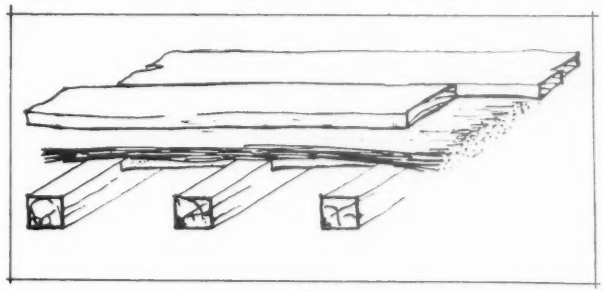

FIG. 2.—*Boarding on 1 in. quilt of reeds, carried on squared joists. Norfolk; probably 17th century (F. W. Troup).*

the reduction of air-borne sound transmission across the air-space. It may even be that in this particular case the use of cockle-shells for the filling reflects some acoustic theory of those early days in science, though it probably did not take long for builders to discover that it was far less useful than the solid clay or lime fillings which were formerly used and which continued to be common practice subsequently.

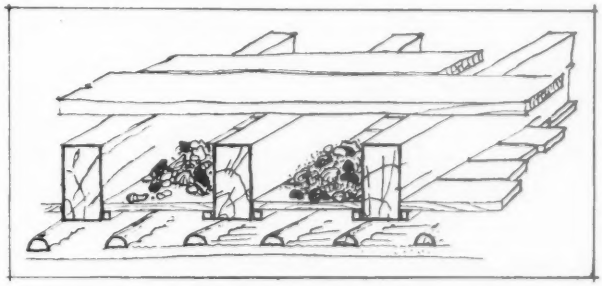

FIG. 3.—*Timber joist floor with cockle-shell pugging on sound boarding and an independent ceiling below. Hampton Court Palace; late 17th century.*

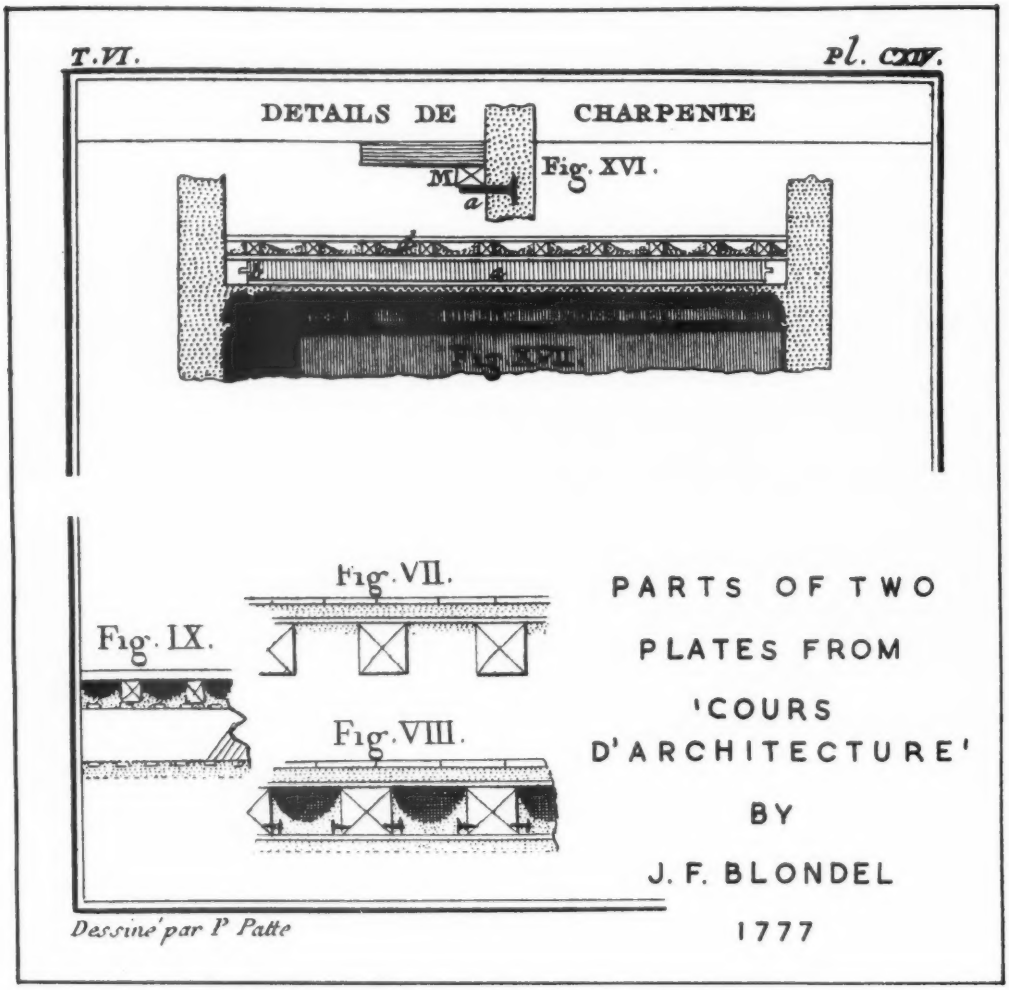

FIG. 4. *In this plate, Fig. VII is a construction in which close lathing is laid on top of the joists, which are then covered with 2 in. to 3 in. of coarse plaster to receive the normal paved finish. The underside of the laths, between the joists, is given a finish of fine plaster.*

Fig. IX is a floor which was said to be common in domestic building, being light and economical. Laths are placed on the top and bottom of the joists; the battens which take the parquet floor are bedded on the top laths, the screed being troughed between the battens; the laths on the bottom are given a normal plaster ceiling.

Fig. VIII shows a method of ensuring a good key to the ceiling by throwing plaster from above on to nails just over the laths. Apparently ceiling failures had occurred which were attributed to masons who attempted to economise in plaster by spacing laths too closely, thus preventing a good key.

Fig. XVI is merely an illustration of common floor practice without pugging.

It is, perhaps, puzzling at first sight that a construction of this refinement received no attention in English textbooks of the time except for passing references to what was called sound-boarding (8) (10). One must guard against the assumption that the construction was therefore unusual, for though we do not know how widely it was used, refinement to this degree strongly suggests that it was in fact an element in a live tradition; in which case, and in common with many other traditions, it may have been too well known to seem worth a detailed description. This happens widely to-day and seems a more reasonable interpretation of the facts.

Possibly another reason for overlooking an item of this kind was the preoccupation in England with the work of separate trades rather than with the functions of building elements. In France, where a more comprehensive view of building seems to have been taken, we do find better descriptions of construction techniques. Blondel, for instance, in his *Cours d'Architecture* of 1777 (5) mentions several lime-filled floors, some of which are shown and described in Figure 4.

Pugged floors continued to be built in this country into the nineteenth century. Constructions uncovered by the blitz in Kensington and other areas of mid-Victorian expansion show very little change from the earlier types (9) (10) (Figures 3, 5, 6 and 7). One new factor of interest did show itself at this time, however, for complaints not noted previously now became frequent, and floors once apparently adequate became a subject of concern to the builder. Throughout the nineteenth century building textbooks and writings in architecture alternate between

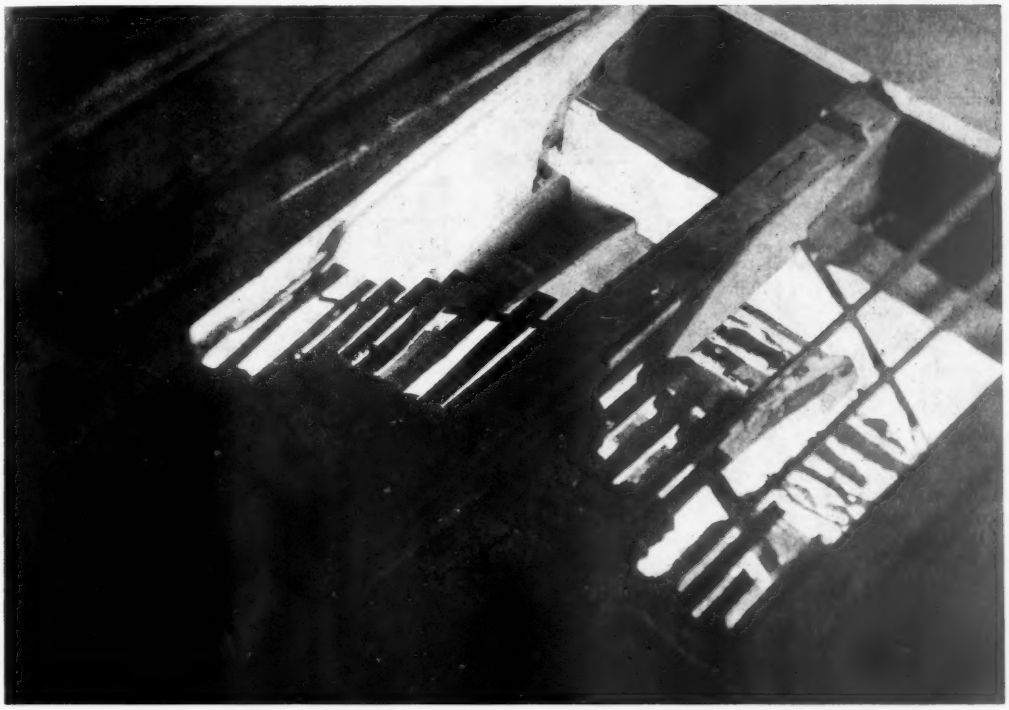

FIG. 6. *Photograph taken from above during the repair of an 18th century pugged floor. The floor was photographed by courtesy of Denis Roberts [A.]. See Fig. 5 (below) for details of construction.*

complaints of the existing insulation and ineffectual suggestions for improvement (11). Thus the Editor of *The Builder* in 1857 (12) :

> "Men of ingenuity, lend us your ears. There is no greater nuisance in modern houses than that of the transmission of sound through party-walls. Any practical, inexpensive and efficient means of deadening sound will be a great boon. Solid walls and solid floors transmit sound in the highest degree . . . How is the evil to be overcome? 'For eight years,' writes a studious friend to us, 'I have occupied a house in London ; and, during the whole of that time, there have been neighbours having young families. They are musical, and, I must confess, labour most industriously at the scales : morning, noon and night one or other child howls and strums, apparently without making any progress.' There is no objection to neighbours' children learning music and singing : quite the reverse ; but it is most objectionable that walls should so readily transmit sound, and render the young ladies' efforts so widely known. Some persons always take a corner house, so as to be free from such nuisance on one side at least. Is there no remedy?"

And later Lord Grimthorpe (13) :

> "I am told by an architect of considerable experience that he thinks pugging, that is plaister on lathes forming in effect a second ceiling, does not make much difference . . . I have no doubt that it is inferior to all the porous substances which break the waves of sound much more than anything that becomes solid like plaster."

One of the main causes of trouble may have been the increasing popularity of the upright piano which replaced its softer-noted predecessor, the "square" piano, in the first decades of the century ; and the increasing proximity of neighbours in rapidly-growing cities must have aggravated the problem a great deal. Also, the fact that the upright piano stood against the wall was a factor.

The problem remained unsolved until very recent years, when active research in America, England, Germany and Sweden led to an understanding of the main principles (14). In this country these seem to be passing fairly rapidly into common practice.

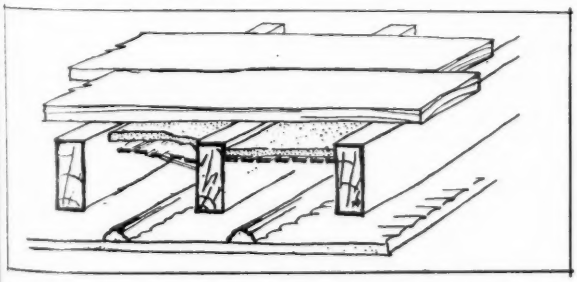

FIG. 5.—*Timber joist floor with clay pugging on laths and a suspended ceiling. London ; 18th century. See also photograph Fig. 6.*

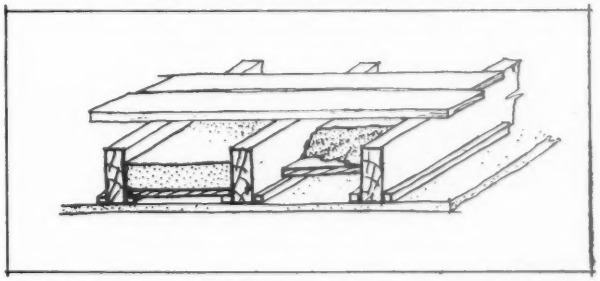

FIG. 7.—*Timber joist floor pugged with 3 in. lime on sound boarding. London ; 19th century.*

Early Scientific Studies of Insulation

To a large extent the studies which have shown the way to adequate insulation waited upon the development of special instruments; somewhat ironically, in fact, the electrical work which gave us radio gave us also many of the laboratory techniques through which sound insulation was effectively developed. But the brief historical study which is the subject of this paper uncovered one hitherto unknown and somewhat notable early experiment in sound insulation which deserves to be remembered.

In 1836, H.M. Commissioners of Prisons approached Dr. Reid and Professor Faraday for advice in the construction of a wall that would prevent the transmission of intelligible communication between cells. Although the principle of separate confinement was later carried to the limits of cruelty (15), at this stage of penal history, it represented a major step forward. The value of segregating the weak from the vicious and of providing quiet for meditation had been the subject of government enquiry since the later eighteenth century (16), and in providing sound insulation the commissioners of 1836 were implementing recommendations that had been made more than fifty years before (17).

Reid had already been engaged on the problem of sound in relation to structure by his work to improve the acoustics of the House of Commons (18); Faraday, so far as we know, was consulted simply as a physicist with no specialised knowledge of the particular problem. It would be a valuable contribution to a study of the history of scientific method if we had any account of this specialised mind attempting a solution to a general problem. In fact, though Faraday kept the most comprehensive notebooks on the rest of his work (19), there is no mention of any studies of sound transmission. The only report which does remain to us of this, apparently the first scientific attempt at a solution, is that given by the annual report of the prison commissioners for 1837 (20). This was traced in the first instance through French sources (21). As may be expected, this report concerns itself more with the results achieved than with the underlying theory that led to the methods tried. The story of the experiments is of some interest and is best told in the words of the report itself.

> "At Professor Faraday's suggestion, we proceeded to erect a series of walls between the two experimental cells already noticed, and we carefully recorded the successive experiments which we made upon each wall, before it was removed to be replaced by another . . ."
>
> "The partition first erected . . . (Fig. 1)* consisted of two nine-inch brick walls, worked in cement, with two inches and a quarter space between, filled with sand. This wall, though 20¼ inches thick, permitted the transmission of intelligible sound: that is to say, two persons in these cells, separated by this partition, could, by speaking distinctly and slowly, in a loud tone of voice, make themselves understood by each other."
>
> "Professor Faraday's next suggestion was, that the inner surfaces of these walls should be jagged, so as to break up and interrupt the regular propagation of sound. He judged that the effect of this alteration would be, that the irregular surfaces would so disturb the vibrations of that portion of sound which was transmitted through the walls forming the partition, as to render it indistinct and unintelligible. He likewise suggested that there should be a wider intervening space between the walls. We, therefore, in the first instance, removed one of the nine-inch brick walls . . . and erected in its stead the 13-inch jagged wall with a space of five inches between the walls, as shown in . . . Fig. 2. In this experiment, the whole partition was 27 inches thick; the inner surface of one of the walls of which it was composed being jagged, and the other smooth; thus having an opposite and very irregular action upon the vibrations of sound. This partition-wall we found to be a decided improvement upon the last; for though intelligible sounds could be transmitted, still the effort required a greater exertion of voice than in the former case, and the fatigue of keeping up a communication became considerable."
>
> "In our third experiment we removed the other nine-inch brick wall, and built in its place a second 13-inch jagged wall, with five inches space between, as shown in . . . Fig. 3. The whole partition was, in this case, 31 inches thick; the irregular jagged surfaces of the walls which composed it being opposed to each other. Here we found a further improvement: the difficulty of communicating was increased: the efforts of the speaker to make himself understood became quite painful, and could not be kept up for more than a few minutes. Monosyllables alone could be heard, and those only by allowing long intervals between each: words of two or three syllables were confused, and quite unintelligible."
>
> "Professor Faraday also recommended that, in addition to the two jagged walls, with space between them, we should try the effect of suspending a curtain, of one or more folds' thickness, between the walls. Our fourth experiment, therefore, consisted in suspending two thicknesses of sail-cloth, hung in loose folds, between the walls, as shown in . . . Fig. 4. We have the satisfaction of stating that through this partition we could not succeed in transmitting any intelligible sound. We could hear knocking, a shrill whistle, and the mere sound of the voice, though faint and distant; but we did not succeed in discerning any significant sound whatever; though the greatest possible efforts were made by individuals of powerful voice, uttering the shortest and simplest words, and leaving an interval between each, so as to allow the vibration caused by one sound to die away, before the next was uttered. And we have no doubt that it will be a matter of much satisfaction to Professor Faraday to learn that his suggestions, respecting a mode of preventing the transmission of intelligible sound, were attended with a success so complete as that which we obtained by means of the experiment recommended by him."
>
> "
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> . . . . . .
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> We . . . carefully considered in what way we could arrive at the same successful result in a more permanent and less costly shape; and . . . we constructed the partition . . . consisting of two nine-inch brick walls, two spaces (three inches and three-quarters), and a four-and-a-half-inch brick wall in the middle, which performs the office of permanent curtain, Fig. 5 . . . Through this partition, also, we failed in our attempts to transmit intelligible sound; and it proved, in every respect, as successful an experiment as the last."
>
> "As there was considerable reverberation upon striking either of the outer walls of which the partition is composed . . . we tried . . . the filling up of these spaces with sand . . . This diminished the reverberation; but it appeared to us that the transmission of sound was, though but slightly, rendered more easy . . ."
>
> "In giving this short narrative of the different results of the experiments which we have made, and which we consider important, as conveying information and faithfully recording facts with reference to the transmission of sound (a subject which has been but little experimented upon, at least with the precise view and under the peculiarly advantageous circumstances under which our experiments were made) it has been our endeavour and design, simply and accurately to register those results which passed under our own observation, without any attempt at scientific or technical description. And it will afford us much gratification if our experience in this case (of which we have here given a faithful account) shall be found to supply any additional information upon a subject so interesting in itself, so useful in its practical application, and which may prove valuable to those who are better qualified than ourselves to apply it. But, so far as our own object has been concerned (the construction of a separate cell) we have arrived at this important conclusion—that any one of those partitions which we have caused to be constructed renders the communication so extremely difficult, that, for all practical purposes, entire separation is secured; and all attempts at intercommunication are rendered hopeless by the almost insurmountable barrier which these partitions present against the transmission of sound, and which would render any attempt to communicate, on the part of the prisoners, an effort at once so painful and exhausting, that the agent would feel the continued exertion of it almost as a punishment."

The nature of the trial constructions does not display any precise understanding of vibration in buildings. Faraday and Reid seem to have overlooked or underestimated the possibility of indirect transmission along the side walls, though they might have determined this by putting their ears to the wall in various places. As a result, they secured only a very modest improvement over that which the mass of the construction (thirty inches in thickness) alone could have given, which would probably be something of the order of 60 db. reduction. Modern techniques of full discontinuity, using only three leaves of 2½ in. breeze concrete, have yielded average reduction factors of 75-80 db., which in theory would require 15 or 20 ft. of solid masonry (23). By this comparison the early studies achieved no high efficiency.

* These figure numbers refer to the separate items in Figure 8.

Fig. No. 1.

Two 9 inch brick Walls with 2½ in. space between filled with Sand.

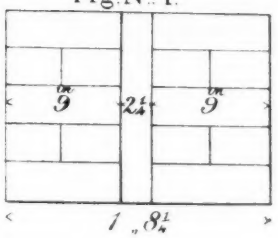

Fig. No. 4.

Two Walls as No. 3 with 2 thicknesses of Sail-cloth hung in the middle

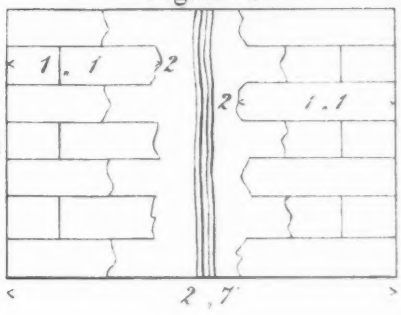

Fig. No. 2.

Nine inch brick Wall and 13 in Jagged Wall with 5 in space between

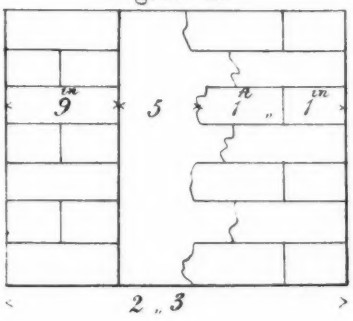

Fig. No. 5.

Two 9 inch Walls two spaces of 3½ in. and 4½ inch Wall in the middle.

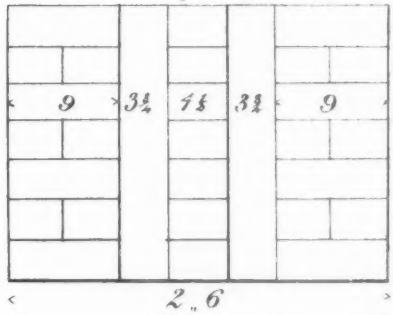

Fig. No. 3.

Two 13 inch Jagged Walls with 5 inch space between

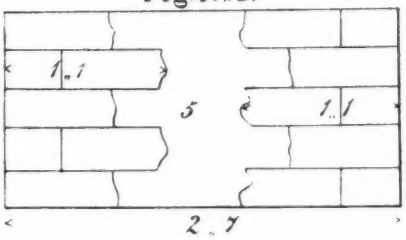

Fig. No. 6.

Walls as No. 5 and the 2 spaces filled with Sand.

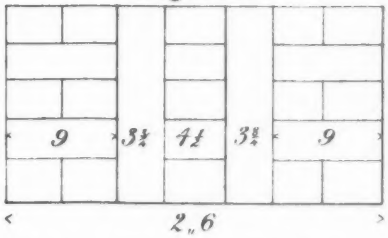

FIG. 8. *The experimental walls examined at Faraday's suggestion, as illustrated in the Report of the Prison Commissioners for 1837.*

One must wonder slightly at this, as we might have expected that ideas on sound transmission should by then have become fairly clear. As far back as the beginning of the century Chladni had examined and illustrated the vibration of plates by the formation of what we call Chladni figures, and it is mainly by such vibrations that sound is transmitted from one side of a wall to the other. Yet it is just possible that Chladni himself was not clear that the thick wall and the thin plate behaved somewhat similarly in this respect; consider, for instance, the following passage (22) :—

"183. Air is the normal medium by which the vibrations reach our ears but any media, whether liquid or solid, will serve the same function.

184. In the propagation of sound by air, or by any other medium, one may consider the noise source as lying at the centre of an infinite number of rays of noise which, pushed through the air by the vibrations of noise source, cause the particles of air alternatively to contract and dilate and so transmit the vibrations in a series of waves. Even when the air is agitated in one direction only, as by the blow of a lash, this line will be the centre of sound waves travelling in all possible directions, because the air is equally elastic in all directions.

189. Each point of a sound wave may be considered as a new source, transmitting new sound waves in all directions. Thus one hears a noise originating behind a thick wall though it is weaker than the sound that came by straight line transmission. *Sound*

transmission is not effected by vibrations of the whole mass of the wall, as some have claimed, but by secondary vibrations which, being initiated by the primary vibrations as opposed to the noise source itself are in consequence weaker."

The italics are the authors'.

Whether or not the passage is as significant as it seems, there is no doubt that the importance of flexural vibration has been largely overlooked, and the idea that sound goes through a wall in some curious way is still widespread.

We can only suppose from the character of the period with its devotion to research for its own sake and its interest in the application of science confined mainly to mechanical engineering, that conditions were not favourable to a real and continuous interest in the scientific problems presented by buildings. No doubt also the inability of experimental techniques to give quantitative measurements of sound insulation was a barrier to progress in this field. This remained the case through a substantial part of the century, and the first physicist who appears to have seriously tackled noise in buildings was F. L. Tufts, working at Columbia University in America at the end of the nineteenth century. His phraseology has become familiar by the unconscious repetition of later writers :—" On account of the increased noisiness of cities and the desirability of excluding these noises from offices and dwellings, a knowledge of the laws governing the transmission of sound through various materials is becoming daily of greater importance . . ." (24). His particular concern was only the design of a sound-proof telephone kiosk, but this led him to experiment on the transmissivity of different non-porous materials. He had already related sound transmission to air movements through porous materials (25), and he now empirically related them to the vibrations of the transmitting material. This empiricism was necessary as the vibration could be measured by a micrometer ocular, though there was still no improvement on the human ear for measuring sound intensity. By a series of comprehensive tests and nice conclusions, he determined that the overall vibration of a material transmitted more sound than the elastic wave in the material, and hence that the sound insulation depended on the rigidity of the material. For equal rigidity of two materials, he observed that added weight would give added insulation. He was unable effectively to study complex constructions, and with particular reference to the telephone kiosks, he decided that the double cavity construction then in use was likely to be less effective than the same quantity of material fixed rigidly together. This, as we know now, need not have been the case. Tuft's work, nevertheless, deserves much more recognition than it has had. Much of it was a clear advance along the correct path, and had it been used as a starting point for subsequent work we might have arrived more quickly than we have at a working knowledge of the subject. As it was, it seems to have been overlooked, for even so eminent an authority as W. C. Sabine remarked that it was not until 1904 (some years after Tuft's publications) that his attention was drawn to the importance of sound insulation studies (26). He then apparently proceeded along lines which led to somewhat similar conclusions, though he and later workers were able to give them a more effective quantitative assessment.

The subsequent history of the studies need not be examined here. It is sufficient to conclude with the observation that work done in the decade immediately preceding the recent war has at last yielded a balanced view of the subject and adequate knowledge on which to establish some improved building practices. In housing work in this country, we are aiming now at higher standards of insulation between adjoining houses than has ever been the case here or anywhere else, and the study of prototypes of alternative types of houses erected has given promise that we will substantially meet them. We may confidently anticipate, therefore, that at long last we have some reasonable control of this hitherto awkward problem.

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2. " Old Cotswold Farm Houses and Other Stone Buildings in the Cotswold District." E. Guy Dawber, 1905.
3. " Influence on Design in Woodwork." F. W. Troup. (From Arts Connected with Building, 1909).
4. " The generally used mud floors were porous, and so absorbed filth in the shape of nitrous matters. In order to search for, and obtain the nitre required in the manufacture of gunpowder, an official generally known as the salt-petre man had power to throw down the mud walls in common seising to take up the town hall floors, dig up the floors of stables, slaughter houses, etc. . . . The ' salt-petre ' man in his search for nitre caused endless inconvenience and friction in the sixteenth and seventeenth centuries and . . . the requirements seem to have become more onerous in the reign of King Charles I. The abuse of salt-petre digging was swept away during the Commonwealth." The Development of English Building Construction, C. F. Innocent, 1916.
5. J. F. Blondel, in *Cours d'Architecture*, Vol. 5, published in 1777 (Paris), describes four types of lime floor of which the most elaborate development is shown in Figure 4. Although this illustration shows the parquet carried on battens held by screed, the writer mentions that he has seen examples where, for convenience or economy, the parquet is laid direct on the joists; this necessitated some care in dressing the joists level.
6. Sound Transmission in Buildings, by R. Fitzmaurice and William Allen. H.M. Stationery Office, 1940.
7. Specimen Accounts of Hampton Court Palace. August 1691. " —to John Peerman for his carriages £13 10s. for 180 load of cockle shells from the waterside to the New Building."
   September 1691. " — to labourers cleaning the floors between the joysts and filling them in with cockle shells."
   Wren Society, Vol. IV.
8. Specification and prices :—Sound Boarding.

¾ in. single fillets per square	£2	15	0
Ditto, with double ditto	£3	12	0
1 in., single ditto	£3	12	0
Ditto, with double ditto	£4	2	0

   Builders' Magazine, by a Society of Architects, 1774.
9. Floors of the type shown in Figure 6 have been reported from Upper Grosvenor Street (1826), Cavendish Place (1840), Eaton Square (1840), and others of a later date.
10. Specification for lunatic asylum at Omagh in Ireland, 1848. " All the floors of the first floor throughout the building to be sound boarded with ¾ in. deal, rough jointed and fixed upon deal fillets 1¼ in. × 1 in. and to be pugged with hair mortar.
11. *The Builder* carried sporadic correspondence at different times on this subject : notably September 6 and 13, 1845, April 18, 1857, April 30, 1864.
12. *The Builder*. Vol. XV, No. 740, 1857.
13. " Book of Building," Edmund Becket, Bart. (later Lord Grimthorpe), 1876.
14. Post-War Building Studies No. 14, Sound Insulation and Acoustics in Buildings. H.M. Stationery Office.
15. Very fully documented evidence on the effects of the silent system in prisons has been supplied by Hobhouse and Brockway in " English Prisons To-day," 1922.
16. Following the American war of Independence, and the subsequent refusal of America to import convicts from England, a commission was established by the British Government in 1778 to investigate the potentialities of this wasted man-power, to be brought out by the provision of model penitentiaries. The scheme fell through on the discovery of the South Sea islands by Captain Cook.
17. Hard Labour Bill, 1778.
18. Dr. D. B. Reid, in a paper to the British Association for the Advancement of Science, 1835.
19. Faraday's Diary, 1820-1862. Published by Thos. Martin in 7 vols. 1932-36.
20. Second Report of Inspection of Prisons in Great Britain. H.M. Stationery Office, 1837.
21. " Rapports sur les Pénitenciers des Etats-Unis," MM. Metz and Blouet, 1837.
22. E. E. F. Chladni, " Traité d'Acoustique." Leipzig, 1802.
23. " Modern Theory and Practice in Building Acoustics," N. Fleming and W. Allen. A paper presented to the Institution of Civil Engineers, 1945.
24. Americal Journal of Science for June 1902.
25. *Ibid*, May 1901.
26. The Insulation of Sound, by W. C. Sabine, The Brickbuilder, Vol. XXIV, No. 2, February 1915.

OBITUARY

Sir Herbert Baker

An Appreciation by PROFESSOR A. E. RICHARDSON, R.A. [*F.*]

The role in which most of us esteemed our distinguished colleague is that of imaginative designer and fervent patriot, and that is a part which has ever secured the warmest sympathy of the Institute. This brief tribute to the memory of an architect renowned for his buildings in South Africa and India, and here in England, does not aim at recording a complete list of his wide activities. On the contrary it is intended to remind the whole profession of his devotion and unswerving loyalty to architecture.

From his earliest years, when he first served as an assistant to Sir Ernest George, until the time when very important commissions were entrusted to his care, his chief inspiration was the quest for beauty. This was to him a lode star, a solace, and a motivating force. Indeed it was something more, for it proved a form of protective armour, and as such it turned aside the shafts of jealousy which every artist invites.

There is no need to-day to dwell upon those trivial differences of taste and divergent opinions, once so caustic, which have been smoothed out by the passage of time. Yet during the height of Herbert Baker's mental and artistic activity there was no architect whose works were so subject to criticism, or one whose achievements were so little appreciated. By sheer tenacity and innate confidence he pursued the ideal which he had set up for his own. This gave him the necessary strength to overcome obstacles which to onlookers appeared insuperable. And for this we honour his memory. He was not wrong in his estimate of human nature, and now that he has passed many of his erstwhile detractors pay homage to his character.

As an architect Herbert Baker was not perfect, no architect has been, or ever will be. He made mistakes and no one was more willing to own this fact or to strive more readily to make good. It was, therefore, this constant endeavour to achieve something worth while which kept him active to the last, amplifying in full those ripe and mellowed years when wisdom succeeds to impetuosity. It will long be remembered of Herbert Baker that he had the rare gift of starting unconsciously the springs of artistic sympathy in others, for he had much of the poet and the philosopher in his being. His colleagues should recall the long period of his professional career, covering as it does the closing years of the reign of Queen Victoria and extending through practically half of the present century. Here, too, is cognate evidence of incessant conflict against odds; of defeats and disappointments.

No man, certainly not an architect, can escape the law of social contagion which belongs to the circles and the period of which he is but an item. And if this is true of one who occupied a high position, how insignificant in stature appear the myriads who toiled in sight of Pisgah.

Artists are judged harshly and more than other men; they become known to the world by their active and voluntary influences, that is by their works and statements. This being so the unconscious influences they exert escape notice, but nevertheless are of the greatest importance. The life and influence of Herbert Baker was no exception to this general rule, he could combine his veneration for culture with kindly thought for his fellow workers; and it was this noble and inspiring feeling which gained him devoted assistants and collaborators.

The secret of this power, its mode, its truth, and its impetus, belongs to the spirit of the time when Baker received his early training. It was enlarged by contact with Cecil Rhodes, for all great characters throw out impulses which are catching. In this way ideas are insensibly propagated; small wonder then that his enthusiasm was kindled for the Dutch architecture of South Africa, and that close regard for things visually attractive in turn encouraged new versions of accepted forms.

It is fit and right that the Royal Institute of British Architects should remember the name of one so eminent, for Herbert Baker gave his whole life to the furtherance of architectural prestige. Not, however, entirely impersonally, for he was justly proud of the honours he had won, but nevertheless with zeal for the future of India and the consolidation of South Africa. It was his hope that the termination of thirty years of world unrest would be followed by a Renaissance of the arts in all parts of the Empire; that scholars would be found eager to resist heresies and to inaugurate a new age of culture and good-fellowship. Architects may well be proud to perpetuate the memory of one whose courage shone like a beacon.

Biographical Note

Herbert Baker, K.C.I.E., R.A., Hon. D.C.L. Oxford and Johannesburg, F.R.I.B.A., R.I.B.A. Royal Gold Medallist, was born in 1862. He was trained in the office of Ernest George and Peto and won the Ashpitel Prize in 1889. He practised in South Africa from 1882, in London from 1913 and in Delhi. In South Africa he was associated with Ernest Willmott, F. L. H. Fleming and A. K. Kendall. In London, Alex. T. Scott was his partner from 1931.

His principal buildings were:—Union Buildings, Pretoria; Cathedrals at Capetown, Johannesburg, Pretoria and Salisbury, Rhodesia. He was associated with Sir Edwin Lutyens at New

Delhi. He designed the Delville Wood Memorial, Tyne Cot and the Indian Memorial, Neuve Chapelle. In England his buildings included the Bank of England ; Rhodes House, Oxford ; South Africa House ; India House ; Winchester School Memorial Cloister ; Church House, Westminster ; Martins Bank, Lombard Street ; Glyn Mills Bank, Lombard Street ; the Royal Empire Society. He also designed Government Houses at Nairobi, Mombasa and Pretoria ; the Rhodes Memorial, Cape Town.

He was architect to the Governments of South Africa, India and Kenya, and one of the principal architects to the War Graves Commission. His literary work included " Cecil Rhodes, by his architect, " and " Architecture and Personalities."

PRACTICE NOTES

EDITED BY CHARLES WOODWARD [*A.*]

IN PARLIAMENT

Housing. Selling Price of Houses

In reply to a question the Minister of Health said that he did not propose to increase the selling price of houses erected by private developers because of the recent advance in wages. This advance was accompanied by a pledge from both sides of the industry that output would return to the 1938 level at the earliest possible moment, and it would be appreciated by the industry that building costs must be kept down. (7 February 1946.)

Town and Country Planning

Asked whether he had any statement to make in regard to proposed legislation dealing with access to mountains, moorlands, rights of way, national parks and the control of outdoor advertisements, the Minister of Town and Country Planning replied that all those matters were under consideration, but he feared that there was no prospect of time being available during the present Session for the introduction of legislation. (12 February 1946.)

Housing and Building Societies

In answer to a question the Minister of Health said that he would be pleased to consider any suggestions which the representatives of the building societies may be able to make to him with a view to making their resources available to facilitate the building of houses for letting, always bearing in mind that the limiting factor to-day is not finance but labour and materials. The Minister added that he hoped there was no misunderstanding between himself and the building societies. He hoped he had made his position clear. If it is necessary to meet them to clear up any misunderstanding he was certainly ready to do so. (2 February 1946.)

Town Planning Schemes

In answer to a question the Minister of Town and Country Planning said that the absence of many owners on national service, and the shortage of technical staff both in his department and among the local authorities, have made it impossible hitherto to proceed with formal steps in the consideration of planning schemes submitted for approval before the war. Moreover, in view of the wider aims of planning which are now generally agreed to be necessary, substantial revision of many of the schemes so submitted will be required before they can be adopted as a proper basis for planning control. His regional planning officers were available to advise authorities as to the nature and extent of the revision required in any particular case. (19 February 1946.)

Housing and the Greater London Plan

In answer to a question the Minister of Town and Country Planning said that he was aware that the Greater London Plan proposes the restriction of building development in certain areas. This Plan had not yet received final approval, and whilst he had asked local authorities, unless there are strong reasons for not doing so, to adhere to the principles of the Plan pending final conclusions upon it, he had, where immediately urgent housing requirements cannot be met in any other way, agreed to the erection of houses in contravention of the Plan where he had been satisfied that no fundamental object of the Plan would be seriously prejudiced. (19 February 1946.)

War Damage Payments

In answer to a question the Chancellor of the Exchequer said that he hoped to settle, in advance of the introduction of a Bill, the total amount to be paid for war damage to each group of public utility undertakings and the total amount to be contributed by each group. The total war damage payments to and contributions from each group would then be fixed by the Bill, which would provide for the making of schemes determining the sums to be paid to and contributed by particular undertakings. The Bill would also deal with undertakings which are not public utility properties but are at present covered by Section 70 of the War Damage Act 1943. He had asked departments to continue discussions with the various public utility groups with all possible speed. (26 February 1946.)

War Damaged Houses. Rent Claim

Asked whether the regulations permit the owner of a war damaged house to claim the rent he has had to pay during the period his house was uninhabitable, the Chancellor of the Exchequer replied that such losses are only one of the many types of loss of income due to the war, which lie outside the field of compensation from public funds. (26 February 1946.)

TOWN AND COUNTRY PLANNING

The Appointed Day from which the five year period is to run during which period applications may be made to the Minister for a declaratory order under Section 1 of the Town and Country Planning Act 1944 has been ordered by the Minister to be 1 January 1946. (S.R. & O. 1945, No. 1666.)

As soon as declaratory orders or compulsory purchase orders become operative under the Act, they must be registered in the register of Local Land Charges under the Land Charges Act 1925. (S. R. & O. 1945. No. 1677/L.24.)

Provisional Town and Country Planning (General Interim Development) Order, 1946.

This Order revokes the General Interim Order which came into force on 1 May 1945, and also the Provisional Varying Order dated 21 November 1945. This Varying Order related to the erection of huts for school purposes and the alteration of school buildings.

The Provisional Order came into force on 1 February 1946 and embodies much of the 1945 Order. General powers of control over surface mineral working and over the deposit of waste materials and refuse have been added, subject to the exceptions set out in the Order.

Any Direction made by the planning authority excluding certain development from permitted development in particular areas or in particular cases, and which was in force at the commencement of this Provisional Order, is deemed to be a Direction under this Order.

Permitted development by a Local Education Authority or the governors or managers of a voluntary school on land held before 1 October 1945 is now authorised by this Order in respect of the erection of huts and the alteration of buildings, for some purpose within the scope of the Education Act 1944.

The General Interim Order of 1945 was epitomised in the JOURNAL of May 1945 under Practice Notes, and can be read in conjunction with the alterations and additions referred to above.

RETENTION OF REQUISITIONED PREMISES

Requisitioned Land and War Works Act, 1945, Section 45.

The Appointed Day under the Act and Section has been fixed as 24 February 1946.

Claims may therefore be made for an increase in rental compensation as from that date in cases where premises requisitioned before the Act came into operation (15 June 1945) are still held under requisition on the Appointed Day, and the compensation under the Compensation (Defence) Act 1939 has been fixed at a lower level of rental value than that obtaining in respect of comparable land on both 31 March 1939 and the Appointed Day.

Claims must be made not later than six months after the Appointed Day or after the date of release of the premises whichever is the later.

Under this Act the Government were given two years from the end of the war period (24 February 1946) to make up their mind whether they wanted to retain any land that they had requisitioned or used during the war. Under the Supplies and Services (Transitional Powers) Act 1945 the Government will be able to retain requisitioned land for a further five years at least before the two year period starts in which they have to make up their mind whether they will release the land or acquire it under the Requisitioned Land and War Works

Act. Property owners will therefore be left in uncertainty for seven, or possibly eight years, before knowing whether or not their land is to be returned to them.

WAR DAMAGE

Quantity Surveyors' Fees

The following scale of fees has been agreed between the War Damage Commission and the Chartered Surveyors' Institution :—

(i) Contracts based on approximate bills of quantities.

Preparation of approximate bills of quantities up to £10,000. 1½ per cent.

Preparation of approximate bills of quantities over £10,000. 1¼ per cent.

Re-measurement on whole work. 2½ per cent.

If during consultation with the Commission as to the most suitable form of contract for the required work of making good war damage it is considered by the Technical Adviser and the claimant's professional adviser that a contract based on approximate bills of quantities is the most suitable, a quantity surveyor to be approved by the Commission may be employed by the claimant on the above terms.

(ii) Prime cost plus fixed fee contracts.

In cases where the commission's Technical Adviser considers it necessary to request the claimant to instruct an outside quantity surveyor to prepare (or check and agree) the estimate submitted on which the proposed fixed fee is to be payable, a fee of ½ per cent. will be paid for such services.

HOUSING

Ministry of Health Circular 25/46 dated 25 January 1946.

This Circular, addressed to Rural District Councils and County Councils in England, states that as from 31 January tenants for war-time agricultural cottages will be selected by the Rural District Council in the same way as for any other Council cottages in respect of which the agricultural subsidy is paid. The Circular enclosed a copy of the Memorandum issued by the Ministry of Agriculture to the County War Agricultural Executive Committee regarding the provision of houses for the Agricultural Population, reference AHB. 5893, Serial No. 2058, dated 25 *January 1946*.

Ministry of Health Circular 20/46, dated 22 January 1946, issued to Housing Authorities in England.

This Circular deals with the possibilities of converting surplus temporary war-time buildings to housing use.

Local authorities are asked to submit proposals to the Minister for taking over temporary buildings for conversion in cases where the conversion would not be uneconomical, or where the diversion of labour and material would not unduly interfere with the erection of permanent housing.

In approved cases the buildings will be handed over free of charge to the local authority. The local authority will purchase the land from the Government at an agreed price. Requisitioned land may be compulsorily acquired by the local authority or the land may be acquired by agreement on the same price basis as if acquired compulsorily. The cost of conversion must not exceed £250 per dwelling and the rents will be agreed with the Ministry.

The dwellings will be removed at the cost of the Exchequer after ten years.

The Circular deals in detail with the matters which the local authority must take into account in considering the possibilities of conversion.

Ministry of Health Circular 34/46, dated 8 February 1946, issued to housing authorities in England, states that copper is at present in good supply and that therefore local authorities may wish to consider making use of it in their housing schemes. Materials used should comply with the British Standards Specifications for copper products. Precautions may be necessary to avoid corrosion where copper and some other metal are used in the same system.

HOUSING SUBSIDIES

The Housing (Financial and Miscellaneous Provisions) Bill fixes the Exchequer subsidies and rate contributions for new houses built by local authorities in England and Wales. (When the Bill becomes an Act the fact will be noted.)

General Standard Subsidy

Exchequer, £16 10s. per house per year for 60 years ; local authority contribution, £5 10s. per house per year for 50 years. (The capital value of the Exchequer subsidy at 60 years purchase is £445 10s. and the rate contribution at 60 years' purchase is £148 10s., a total of £594 per house.)

Special Subsidy for Houses for Agricultural Workers

Exchequer, £25 10s. per year for 60 years ; rate contribution from the local authority, £1 10s. per year and from the county council £1 10s. per year. (The capital value of the Exchequer subsidy is £689 and the rate contribution £81, a total of £770.) The same subsidy will be paid for all houses built in areas with a population of low rent-paying capacity and where housing puts an undue burden on the rates.

These subsidies will apply to all houses completed by local authorities by 30 June 1947. They will be retrospective in respect of certain houses completed during the war and will apply to all houses approved under the post-war programme since 3 August 1944. The subsidies are payable for two-storey houses of all sizes approved by the Ministry of Health and the average size of the three-bedroom house upon which the standard rates have been calculated is 900 square feet with the addition of 50 square feet for outbuildings.

Flats

For blocks of flats on expensive sites (cost of developed land exceeding £1,500 per acre) a graduated subsidy scale starting at £28 10s. per year for 60 years from the Exchequer and £9 10s. for 60 years from the local authority ; with an additional £7 a year from the Exchequer and £3 10s. from the local authority for each flat in blocks of at least four storeys *where lifts are provided*. Subsidies at the same rate as for flats will be paid for houses built on expensive sites as part of a mixed development of flats and houses.

Highly Rated Areas

Additional Exchequer assistance of not more than one-half of the rate contribution (which will be correspondingly reduced) may be given in highly rated areas where the cost of housing to the rates is *at least twice* the average for that class of district.

Mining Subsidence

Where the cost of a house is increased substantially by the need for providing protection against mining subsidence, additional Exchequer subsidy may be given up to £2 per year for 60 years, with a rate contribution in addition of one-half of the Exchequer subsidy.

Non-traditional Houses

Where non-traditional methods of construction approved by the Ministry of Health substantially increase the costs over traditional methods, the Exchequer may make a grant towards the excess. These grants will apply to all houses included in approved proposals *up to the end of 1947*.

Private Building for Agricultural Workers

Private persons building houses for agricultural workers will receive a maximum Exchequer contribution of £15 a year for 40 years. This will apply to each new house completed after the date of the Act provided the house is either owner-occupied or is let at a restricted rent, i.e., is not a " tied cottage."

Housing Associations

Housing associations may be set up to build houses for local authorities or the association may arrange with the local authority to build the houses and retain the ownership and management. The Exchequer may provide working capital for these associations.

Note

In the debate on the Second Reading of this Bill on 6 March an amendment was moved deploring the fact that no provision was made for assisting the conversion or reconditioning of houses. In resisting this amendment, the Minister of Health said : " War Damage and cost-plus have had a most demoralising influence upon a section of the building industry, both workmen and employers. When the war damage is over the Government want the workers to go on to the straightforward clean job of building new houses. If you take them from war-damage work and put them into conversions again it does not satisfy the craftsmen's pride. We can go back to conversions later. I hope hon. Members in no part of the House will press me at this stage to implement the Report on the Conversion of Existing Houses. It will require legislation, and very complicated legislation at that. At the same time it will use up skilled labour, which is in very short supply and which we need to-day on our new housing schemes." On a division the amendment was lost.

BOOK NOTES

Conversion of Existing Houses. Ministry of Health. H.M. Stationery Office. 1s.

The Ministry of Health have now published some half-dozen reports on various aspects of post-war housing. The present book on conversion to flats and maisonettes of various types is one of the most useful, and certainly one of the most timely, of an excellent series. No one would pretend that in normal times conversion was in any way comparable as a system of housing with either mansion flats or with well-planned separate dwellings. When, however, we seek out the quickest and most economical method—*in present circumstances*—of providing sound self-contained habitations, using a minimum of material and of skilled labour, then conversion in some form becomes very fully justified, indeed it becomes an outstanding method—whether carried out by private enterprise or by local authorities. The statistics of this Report are full proof of this thesis. The layman who wonders where the post-war houses are, almost certainly fails to realise that (pending the launching of the Government's real housing programme) several hundred families have been housed in several London boroughs alone—Wandsworth is an outstanding example—by sound and considered conversion of a great variety of properties, from small terrace houses to Victorian mansions.

The Ministry's Report gives very full data on all aspects of the subject. It touches briefly on history, showing how very little conversion was done under the permissive Acts of 1919 and 1936, when the circumstances were, of course, less compelling. It then outlines the results of the very valuable "sample surveys" which have been taken in typical London boroughs and in certain provincial cities. In five Metropolitan boroughs alone it was found that out of a total of 160,350 houses, about 27,500 are, in one way or another, suitable for conversion—and it is important to note that "suitability" was not interpreted in too wide a sense.

While war-time difficulties made an adequate survey of rural areas impossible, the Advisory Committee are no doubt correct in stating that country people dislike communal dwellings and that water, sewage and transport difficulties are greater than in the towns. They are supported in their conclusions by the Rural District Councils' Association, who are against conversion.

In its recommendations as to actual methods of conversion the Report is unexceptional, but it is questionable whether local authorities are at the moment converting in accordance with the standards proposed, e.g., in the provision of laundry facilities, pram storage, etc. The Report accepts as reasonable the restrictions imposed by the Town and Country Planning Act. The fact remains that the L.C.C. is liable to reject—in the case of private enterprise schemes—proposals which the local authority welcomes. The question arises whether "density" should be the only yard-stick by which the character of a planning proposal should be measured. The L.C.C. is also, in the case of private enterprise schemes, a delaying factor of some two months—a point of importance since conversions are, in the nature of things, an affair of some urgency.

The rather difficult question of the management of communal dwellings—stairs, yards, garbage, noise nuisances, etc.—is only touched upon by the Report and one would have liked to have seen this dealt with more fully, since, in some cases, we believe it has proved an actual, though unnecessary, deterrent to conversion.

Perhaps the least satisfactory feature of the Report is, inevitably, the series of plans printed at the end. These are excellent in themselves and give a good idea of what can be done in the way of converting certain "type" houses to flats. What is not indicated is the vast possibility and considerable difficulty inherent in replanning the multiplicity of queer and weird houses which abound by the thousand in the deserts of nineteenth century suburbia. The whole problem is a fascinating one and those who have worked on it know that it is socially, but not æsthetically, rewarding.

The sub-committee of the Central Housing Advisory Committee who have drawn up the Report, under the chairmanship of Mr. Lewis Silkin, are to be congratulated on having produced a most valuable and genuinely useful document.

R. Furneaux Jordan.

The Reilly Plan, by Lawrence Wolfe. Sm. 8vo. 156 pp. London. Nicholson & Watson. 1945. 6s.

Somewhat belated attention to Lawrence Wolfe's book on *The Reilly Plan* would be a matter for apology if in the months that have elapsed since its publication the plan and Mr. Wolfe's spirited and brilliant "write-up" had passed into the dim limbo reserved for transient bright ideas. But it is by no means so—not least, this sparkling little book is still alive—and relevant—as by far the most humane consideration there has yet been of Human needs in Planning—as the recent almost inhumanly learned conference at the R.I.B.A. had it. The author would certainly claim that everything he has said is the direct expression of Sir Charles Reilly's scheme for neighbourhood planning and this is largely true; but Mr. Wolfe has worked like a first-class portrait painter who has selected what is significant and expressed it with a genuine and even passionate liveliness which makes his portrait a thing on its own just because it is so well charged with knowledge and with sympathy for its subject.

It is the most remarkable feature of Sir Charles Reilly's imagination and lively social conscience that he has, in the fact of this plan, stepped across the boundaries of expertisme and pedantry and orthodoxy, which divide so many planners from their subjects, the ordinary people, and has entered into the common, simple scene, into the realm of the ordinary family and its problems. The solution which he offers to the problems he has selected is constructive and progressive in the sense that his plan is determined as a positive, creative element in social life. Sir Charles Reilly and Mr. Wolfe emphasise that their main intention is to break down the individualistic, narrowly confined concept of the English home that prevails not only as the characteristic of present housing estates but also, so they claim, in the house and community planning practice advocated in the Dudley Report and most currently accepted neighbourhood planning proposals. The difference between the Reilly Plan and all other conceptions of neighbourhood is simply that the latter are all based on the maintenance and sometimes on the active stimulation of the isolationist idea that the Englishman's home is his castle. Mr. Wolfe endeavours to show by quotation from official reports and planner's remarks that even the best "rival" community plans only provide palliatives to the evils resulting from the isolation of home from home, the reserved semi-detached mind so encouraged by our suburbias and even in our best-planned garden cities. "Community facilities" in such places are *added to* and not completely made *extensions* of the home. In the Reilly Plan all the normal home functions of birth and death, cooking and eating, child care and play, school home-work, love-making and marriage, play and study, and all the accompanying emotional aspects are completely integrated in a socially functional way and in an emotional way with the communal provision for all these things.

How does the Plan propose to do this? The houses are grouped round "village greens," public to all in so far as no one would be kept off them, but in practice each green would be an extension into communal ownership of the private gardens of each house. Each group of neighbours round a green would combine in a variety of ways suggested by the plan to relieve the drudgery and tedium and strain of cooped up isolationist home life. Cooking would be done in communal kitchens, the meals being brought in hot containers to the door, so that the intimacy of eating round the family table could be maintained with none of the hard work usually associated with it and with a vastly better menu and quality of cooking than most housewives can maintain. Children from birth to adolescence would have various provisions made for their health and enjoyment, not by a benevolent external authority but by the existence in the scheme of physical provision to enable the families to run their own co-operative shows. But anyone who wants the whole picture must read Mr. Wolfe's book.

An obvious criticism of the plan as presented is that it disregards some of the technical factors of which modern planning has made much; for instance, the majority of the houses round a green will be badly orientated. Some greens are shown with football pitches in them; games such as this if played heartily are definitely noisy to an unsocial extent. Many of the houses on the greens are inconveniently far from any vehicle access.

But these are questions to which more than one answer can be given and the Reilly answer is spirited and creative and certainly should be tried out full scale. It is direct and simple and engagingly humane, in many respects it is revolutionary in its idea and not less so, as a whole, because many of the parts are not new. The essentially new thing is the complete combination of two contrasted concepts of home life and communal life. The house as envisaged by the plan is not a weakly-constituted small social element that exists because it must of biological necessity, nor are the communal elements theoretically conceived "get-together" mechanisms provided as communal substitutes for the poor of what rich people buy as private property. Home life is released, intensified and realised; the communal life is wholehearted, complete and functional. That at least is the claim so excitingly and intelligently made by Mr. Wolfe.

Data Book for Civil Engineers by Elwyn E. Seelye. Vol. I. Design. x + 417 pp. + xxii. New York: Wiley. London: Chapman & Hall. $7.50, £2 10s.

As its title indicates this data book is principally intended for engineers, but a large amount of information is included on matters commonly within the architect's interest. The book is a valuable addition to the office reference books which are more and more needed as the range and complexity of technical problems increases.

The first section is of plates of factual data on structure generally, loading, structural formulæ, conversion factors, etc. The next four sections are of structural data relating to concrete, steel, wood and plywood, the latter including nailing and connector details. Subsequent sections deal with foundations, wall footings, piling, soils and soil mechanics, including a useful tabulation of the Casagrande classification of soil types and properties.

An important section of twenty-eight pages gives information of airport siting, landing field structure, layout, sizes and lighting, and "Master plans" for various airport types are given. Four pages give sizes of various athletic fields. Sewage treatment and drainage is dealt with in detail. The book ends with an uncommonly good index.

Vier Jahre Hermann-Göring-Werke, Salzgitter. 4to. 159 pp. 1941. n.p.

The vast Hermann Göring industrial enterprises at Salzgitter, which acquired an almost mythical reputation for size and efficiency, remained a closed secret except for what spies and Dr. Goebbels could tell until our armies of occupation walked in. This well-produced book is a general illustrated description and was produced in a limited edition early in the war as a summary of five years' development of the site from a simple Hanoverian village to one of the largest groups of heavy industrial works in the world.

Problems of siting, including transport, geological conditions, etc., are described and the principal mining and mineral works and their surface buildings are illustrated in some detail. There are no plans.

Das Grundrisswirk, by Otto Völckers. 4to. 384 pp. Stuttgart, Julius Hoffmann. 2nd Edn. 1943. n.p.

Das Grundrisswerk is a source-book of plan types and was a standard German teaching and practice textbook. This copy of the 2nd edition has come to the Library as a gift from Mr. M. Hartland Thomas.

The book consists of plates of excellently clear plans drawn so as to show the essentials of form and function. Each type of building is introduced by a two-page text and the plans of each example are accompanied by brief notes.

The main groups of building types illustrated are as follows: Houses, community buildings (children's homes and hostels, club houses, community centres, congress halls and concert halls), hospitals and sanatoria, schools, technical colleges and universities; buildings for music, cinema and theatre; sports buildings, hotels, canteens, restaurants; shops and stores, industrial and technical buildings; transport buildings, official buildings (including the types required by Nazi Party organisations); churches.

The choice of examples is good and the book as a whole is a valuable work of reference.

Works of Art in Italy. Losses and Survivals in the War. Pt. I. South of Bologna. 8vo. 80 pp. H.M.S.O. 1945. 15s. 6d.

This is the official record compiled from War Office reports by the British Committee on the preservation and restitution of works of art, archives and other material in enemy hands. The chairman of the committee is Lord Macmillan. The report, which is excellently printed and illustrated, consists for the most part of an alphabetical list of all the towns and villages in Italy south of Bologna, with brief notes on the state of scheduled monuments at the time when they fell into Allied hands.

The Arts and Crafts of Canada, by D. G. W. McRae. 4to. 80 pp. Toronto, Macmillan Co. 12s. 6d.

The art history of Canada is full of interest and well deserves a monograph, but something more and other than Mr. McRae's album of pictures is needed to satisfy any but the most casual observer. Canadian art, more even than that of the U.S.A., has been subjected to a variety of powerful influences from Europe, from its own past and from the United States, and to-day art in Canada has to flourish or wilt in the intense environment provided by a high-powered industrialised community. Commercialism, orthodox "respect for tradition," beaux-art influence, the conservative influence of the French Catholic Church, the close contact between the younger Canadian architects and their colleagues in Harvard, are all evident in Mr. McRae's pages, but useful as his service is in laying this mixed dish before us the result is bewildering and disappointing. The examples are presented with an uncritical liberality, original work and purely copyist work are thrown together unexplained. One is left in doubt whether many of the examples have been chosen just because they exist and are needed to illustrate a point in chronology or because they are genuinely felt to be good and worth illustration on their own account. In a book of this size and without an obviously historical critical purpose the latter reason would seem to be the only one worth while. As an historical, even if popular, notebook the value of the book is diminished because so many examples are undated. Many of the photographs are of poor quality and fail to illustrate anything but the vague outlines of objects which are worthy of notice, if at all, not on that account but on account of craftsmanship.

Production Illustration, by John Treacy. Ob. 4to xi + 202 pp. New York, John Wiley, and London, Chapman & Hall. 1945. $4.00.

The author, who is now instructor at the technical school of aviation, São Paulo, Brazil, was production illustration engineer at the Douglas Aircraft Company. His book is largely concerned with types of aircraft drawings which have no reference to architecture but the chapters on perspective are interesting and describe techniques and draughtsman equipment in advance of those normally used in architects' offices.

Linear perspective is clearly and well described and detailed instructions given for the use of the special perspective drawing board developed in the Douglas works which resulted in a marked improvement in quality and accuracy of drawings and in speed.

Electricity in the House, by J. E. Macfarlane. 8vo. 203 pp. London, Hodder & Stoughton for English Universities Press. 1945. 3s. 6d.

There are not many books on electrical installation really well suited for architectural teaching and practice. Mr. Macfarlane's book should prove useful and is probably the only one now available, but it has too much in it which is only of use for electrical mechanics—wiring diagrams, etc., and plug attachments—and too little on the broader questions of design and lay-out of installations which have, in the architect's mind, to be associated with the problems of aesthetic and illumination. Some examples in illustrations are depressingly "raw" in this architect sense, e.g. their arrangement for sink and water heater in plate 8 in which a troublesomely undesigned loose flex hangs down from the heater and presumably dangles loose over the sink if it is out of its point.

Airport Engineering, by H. O. Sharp, G. Reed Shaw, J. A. Dunlop. 8vo, viii + 150 pp. New York, John Wiley, London, Chapman and Hall. 1945. $5.00.

Mr. Sharp is Professor of Geodesy and Transportation Engineering in the Rensselaer Polytechnic Institute and his colleagues are his assistant professors in the same subject. Their book, as is obvious from the authors' qualifications, deals with engineering matters normally outside the architect's authority. It contains, however, carefully compiled and clearly stated information of airport size, site selection. A chapter at the end deals with airport buildings. The examples being more useful for their indication of what apartments are required than for their illustration of how to dispose them.

Review of Periodicals

1945-46- *(continued)*

HISTORY *(continued)*

COUNTRY LIFE, *1945 November 2, pp. 766-8:*
Westminster's Royal effigies: description & historical notes on tomb effigies exhibited at Victoria & Albert Museum before return to Abbey.

IRISH BUILDER AND ENGINEER, *1945 November 17, pp. 599-600:*
James Robb: archt. to Charles II in Ireland. Biog. article by C. J. Robb. Notes on career & buildings. Illusd.

COUNTRY LIFE, *1945 October 26, pp. 732-3:*
Architects' copy books: influence on the designs of country builders: article by Prof. A. E. Richardson on 17th cent. books by Vredeman de Vriese, Langley, Wm. Pain, Plaw, etc. Illusd.

ARCHITECTURAL REVIEW, *1945 Oct., pp. 99-107:*
William Townesend, mason and architect of Oxford: by W. G. Hiscock. Work at Corpus Christi, Queen's, Christ Church, Pembroke, and the Clarendon Bldg., illusd., also Shotover, near Oxford.

BURLINGTON MAGAZINE, *1945 October, pp. 248-52:*
Château de Balleroy, by Francois Mansart. Historical study of Balleroy & Mansart's development, by Cecil Gould & Anthony Blunt.

WERK (Zürich), *1945 Oct., pp. 293-7:*
Francesco Borromini: art. by P. Bianconi, illus. by works in Rome.

ARCHITECTURAL REVIEW, *1945 November, pp. 122-5:*
"A Greenwich treasure hunt," by C. W. Craske, Borough surveyor. Architecture between 1810-1910 illustrated and described and analysed. Reference to Gothic Revival.

ARCHITECTURAL RECORD, *1945 September, pp. 70-5 :*
Victorian prototypes of the present. Illustns. and notes, by F. T. Schwab, of folding doors, ply moulded and sectional furniture, kitchen units, etc.

ARCHITECTURAL REVIEW, *1945 Oct., pp. 90-3 :*
St. Marie's Grange : the first home of A. W. N. Pugin ; by John Piper. Illusd.

REVISTA DE ARQUITECTURA (Buenos Aires), *1945 June, pp. 220-5 :*
Architectura en todo : urbanismo en todo—the complete architecture : the complete town planning. Paper by Le Corbusier to the 3rd conference of the faculty of pure science, B.A. 8.10.29 [*sic*]. Reprinted.

SOUTH AFRICAN ARCHITECTURAL RECORD, *1945 June, pp. 117-21 :*
British architecture through the ages : a survey by John Summerson. Illusd.

WERK (Zürich), *1945 November, pp. 339-44 :*
Existing tendencies in modern English architecture. Short review by F. Olten, illusd.

BUILDING, *1945 September, pp. 231-6 :*
T. S. Tait [*F.*] in Architect-artists series, by Leathart.

BUILDING, *1945 October, pp. 256-61 :*
Le Corbusier : biographic and critical note by G. Holt. Illusd.

ARCHITECTS' JOURNAL, *1945 September 27, pp. 223-4 :*
Oslo, new buildings. General description of Oslo since 1939, by A. E. Davis. Illusd.

WERK (Zürich), *1945 April, pp. 97-112 :*
Swedish architecture and furniture. Articles, inc. memoir of Asplund. Illusd.

ARCHITECTURAL FORUM, *1945 September, pp. 130-48 :*
Switzerland. Review of contemporary archre., inc. illusns. and descriptions of Cantonal hospital, Basel, by Vischer, Baur and Dürig ; Auditorium and convention hall, Zürich, by Moser, Steiger and Haefeli ; Elementary sch., Zürich, by A. H. Steiner ; Library, Lugano, by C. & R. Tami ; Evangelical Church, Zürich, by Moser ; Flats, Zurich, by Seun. Newspaper plant, Basel, by Meili ; Research laboratory, Baden, by Rohn ; and many small houses.

JNL., AMERICAN INSTITUTE OF ARCHITECTS (Washington), *1945 September, pp. 125-31 :*
" Louis H. Sullivan—50 yrs afterwards." Assessment by Guy Study.

ARCHITECTURAL RECORD, *1945 October, pp. 74-90 :*
Architecture in Argentina : the work of Jorge Kalnay, inc : Armonia Municipal Market & cold storage warehouse for Santiago del Estero.

DRAWING, &c.

BUILDING, *1945 September, pp. 228-30 :*
" In praise of models," by Sir Stephen Tallents, Public Relations Chief, Ministry of Town & Country Planning. Use in t.p. propaganda and research. Illusd.

WERK (Zürich), *1945 March, pp. 77-81 ; July, pp. 201-7 :*
Professional education : perspective drawing, by P. Artaria.

PENCIL POINTS, *1945 October, pp. 80-8 :*
Photography for the architect by G. E. Kidder-Smith. Illusd. by author.

ARCHITECTURAL VOCATION, PROFESSIONAL PRACTICE

JOURNAL OF CAREERS, *1945 Sept.-Oct., pp. 125-8 :*
Architecture as a career : pt. 1, the work of the architect, by Martin S. Briggs.

ENGINEERING NEWS-RECORD, *1945 September 20, pp. 101-4 :*
Experience with State building codes—Wisconsin. Summary of code & commentary.

ARCHITECTS' JOURNAL, *1945 September 6, pp. 105-6 :*
Architectural competitions. Editorial critical of British competition system.

QUARTERLY JNL., LONDON ASSN. OF BUILDERS' FOREMEN AND CLERKS OF WORKS, *1945 September, pp. 54-63 :*
Running a building contract after the war. Paper by T. P. Bennett. Labour problems, materials supply and control, use, etc., of plant.

ARQUITECTURA Y LO DEMÁS (Mexico City), *1945 July, pp. 86-91 :*
The regulations in Articles 40-50 of the constitution relating to the exercise of professions in Mexico (inc. architectural " registration ").

BUILDING (general)

L'HOMME ET ARCHITECTURE (Paris), *1945 July-August, pp. 13-20:*
The evolution of building technique by A. Balency-Bearn, engineer : The development of modern forms of structure, standardisation & modular design, industralisation. Wall design.

FORM (Stockholm), *1945 No. 7, pp. 137— :*
" Better building " exhibition at Guldhed, Gothenburg. Popular exhibition explaining bdg. technique & architecture. Article on the houses & flats at Guldhed as demonstration of good work.

JNL., ASSN. OF ENGINEERS & ARCHITECTS OF PALESTINE (Tel Aviv), *1945 September, pp. 22-4 :*
Manufacture of building requisites under government control. Note on Palestine experience. Design simplification, standardisation.

ARCHITECTS' JOURNAL, *1945 Oct. 11, pp. 268-9 :*
Standards of the American Concrete Institute : from Institute' *Journal*, June, pp. 559-703. Specimen page showing right and wrong ways of placing concrete.

STRUCTURAL ELEMENTS

IRISH BUILDER, *1945 Oct. 6, pp. 507-8-10-12 :*
Introd. to soil mechanics : art. by E. Hanrahan, A.M.I.C.E. Illus. of apparatus for determining liquid limit.

CIVIL ENGINEERING, *1945 October, pp. 226-8 :*
Foundation problems & geology. Soil mechanics with particular reference to Thames Valley.

SCHWEIZERISCHE BAUZEITUNG, *1945 September 15, p. 118 :*
Minimum wall thickness in relation to height, form of consin., etc. Illusd.

BUILDING, *1945 November, pp. 298-303 :*
Prefabricated panels by E. Neel. Summary of develpt. of partition walls by architects " Arcon ". Photos & details.

ARQUITECTURA Y LO DEMÁS (Mexico City), *1945 July ,pp. 77-83 :*
Studies & experiments in the breaking stresses of R. C. beams by J. Creixell.

ARCHITECTS' JOURNAL, *1945 October 18, pp. 287-8 :*
Pressure-impregnated timber floors. Note by F. R. S. Yorke on floors impregnated fluoride chromate & phenol mixture giving immunity from dry rot. Illusd. floor erections.

CONCRETE, *1945 Oct., pp. 213-5 :*
Reconditioning concrete floors : abstract of U.S. Army's instructions. Table of mastic topping mixes.

KEYSTONE (Assn. of Bdg. Technicians), *1945 September, pp. 9-10 :*
Standard panelled and glazed wood doors. Information sheet on sizes.

BUILDING PRACTICE & INDUSTRY

ARCHITECT & BUILDING NEWS, *1945 October 19, pp. 40-1 :*
Influences affecting present organisation [in the building industry]. Paper by T. P. Bennett. Controls, priorities, availability of materials & labour, wages.

L'ARCHITECTURE FRANÇAISE, *1945 August, pp. 15-23 :*
Swedish Cooperative Society housing, factory & shop building. Article on organisation & buildings.

BYGGMÄSTAREN (Stockholm), *1945 No. 14, pp. 247-9 :*
Building in Denmark. Article on bdg. organisation and production, by E. Salomon.

MATERIALS

ENGINEERING NEWS-RECORD, *1945 October 18, pp. 145-8 :*
What to expect in new bdg. materials & equipment. Survey of new materials & new uses of old materials. Gypsum, insulating materials, wood treatment, hollow concrete blocks.

PENCIL POINTS, *1945 September, pp. 107-8 :*
Fire retardants for wood. Building Product Facts series, No. 15.

COUNTRY LIFE, *1945 Oct. 5, pp. 590-2 :*
Quarries of the Lake District ; by Evyn Thomas. Illus. of uses in local bldgs.

L'HOMME ET L'ARCHITECTURE (Paris), *1945 Sept.-Oct., pp. 9-12 :*
Plastics. Physical etc. properties, notes on building uses.

ARCHITECTS' JOURNAL, *1945 Oct. 4, pp. 251-2, xlv i:*
Plastics : talk by L. G. Couzens, B.Sc., to D.I.A.

ARCHITECTURAL CHRONICLE (Moscow), *1945 April, pp. 5-8 :*
Ceramics in architecture. Article on work of the Academy of Architecture Laboratory of Ceramics by A. Korchagin. Production & use of ceramic facings.

ARCHITECTURE CHRONICLE (Moscow), *1945 January, pp. 19-20 :*
Estrich-Gypsum : brief note on properties & uses of gypsum.

ENGINEERING NEWS-RECORD, *1945 October 18, pp. 131-5 :*
Light-gauge steel for peacetime building. Article by M. Malt, Research Engr., U.S. Steel Corpn. Specification & standards, sections, use in large structures & housing.

L'ARCHITECTURE FRANÇAISE, *1945 July, pp. 3-8 :*
Steel in modern office equipment by P. Rémond. office partitions, library shelving, filing cabinets.

ARCHITECTS' JOURNAL, *1945 November 8, pp. 343-6 :*
Aluminium. Paper by Dr. E. G. West. The industry, physical & mechanical properties, alloys, corrosion, fabrication & building uses.

CONSTRUCTION, including PREFABRICATION

ILLUSTRATED CARPENTER & BUILDER, *1945 September 14, pp. 1016-22 :*
Old and new building methods contrasted. No. 17 in Prefabn. series, by R. V. Boughton. A wide survey of prefabn. and comparison with traditional construction and design. [For preceding articles see housing.]

ILLUSTRATED CARPENTER & BUILDER, *1945 September 28, pp. 1070-6 :*
Last words on prefabrication, by R. V. Boughton, summing up prefab. series with notes on site erection, cost, materials and labour.

L'Homme et l'Architecture (Paris), *1945 Sept.-Oct., pp. 25-8 :*
Prefabricated elements & harmony of proportion by Lurçat. Theory of proportion.

Structural Engineer, *1945 October, pp. 493-6 :*
Report of Stains in Stonework by Brickwork & Masonry Sectional Ctte. of Science Ctte. of Inst. Structural Engrs. Causes, prevention & cleaning.

Engineering News-Record, *1945 October 18, pp. 136-40 :*
Concrete building design trend shaped by clear space needs. Article by A. J. Boase. Wide-span roofs, flat slab floors, shell structures, arches.

National Builder, *1945 August :*
The application of civil engineering methods to building construction. Notes on pre-cast reinforced concrete frame constn. system, by Prof. A. L. L. Baker and V. G. Hatherley. Prefabd. units craned into position on multi-storey bdgs.

Concrete, *1945 Oct., pp. 212-3 :*
New Spanish regulations for reinforced concrete : abstract of regns. of Spanish Ministry of Public Works, 1944, differing from British practice.

Concrete & Constructional Engineering, *1945 November, pp. 221-32 :*
Pre-stressed concrete : some new developments. Paper by G. Magnel, Director of R. Conc. Laby., Ghent.

Engineering News-Record, *1945 October 18, pp. 120-3 :*
War-time innovations in timber design. Article by A. G. H. Dietz, Asst. Prof. Struct. Eng., M.I.T. Laminated beams & arches, glues. Bibliog.

Jnl., Incorpd. Clerks of Works Assn., *1945 September, pp. 83-5 ;*

Jnl., R.I.B.A., *1945 Sept., pp. 322-4 :*
External rendered finishes : A.S.B. paper by F. L. Brady, of the B.R.S. Illus.

SANITARY SCIENCE & EQUIPMENT

Architectural Design & Construction, *1945 September, pp. 218-9 :*
Estate drainage design : No. 15 in Practical planning of estates series, by Stanley Gale.

Architects' Journal, *1945 October 25, pp. 302-3 :*
Women's First Electrical Exhibition, Dorland Hall, London, by Electrical Assn. for Women, illustrating domestic equipment.

Trans., Illuminating Engineering Society, *1945 May, pp. 97-107 :*
The lighting of buildings, by Dr. C. C. Paterson, chairman, Lighting Cttee., D.S.I.R. Paper and discussion on Ministry of Works, Post-war building study, No. 12. Contributions on natural lighting, by P. V. Burnett, and artificial lighting, by R. O. Ackerley.

Light and Lighting, *1945 August, pp. 114-5 :*
Brightness, well-being and work. Abstract of paper in Brit. Jnl. of Industrial Medicine, 1944 July.

Building & Engineering (Sydney, N.S.W.), *1945 September 24, pp. 65-6, 68 :*
Light, sight & strain. Paper by Dr. N. M. Macindoe to Illuminating Engineering Soc. of Australia.

Building and Engineering (Sydney, N.S.W.), *1945 August, pp. 68-71 :*
The problems of natural daylight. Paper by P. J. Grundfest. Summary of work done in various countries.

L'Homme et l'architecture (Paris), *1945 Sept.-Oct., pp. 5-?:*
Sunlight & man. Analysis of physical dependence of man on sunlight.

Light and Lighting, *1945 August, pp. 112-3 :*
The hope of post-war sources [of illumination]. Summary of paper by S. G. Hibben, Director, Applied Lighting Westinghouse Corpn., reptd. from *The Frontier*. " Cold " light, metallic vapour.

Arquitectura y lo demás (Mexico City), *1945 July, pp. 64-5 :*
The problems of fluorescent lighting. Paper by Dr. M. Luckiesh.

Pencil Points, *1945 September, p. 98 :*
" Scotching the rumor about fluorescent light & eye trouble." Note on research by Luckiesh.

Pencil Points, *1945 October, p. 110 :*
Cold cathode [fluorescent] lighting. Note in Building Product-facts series on electrical & physical characteristics, colours, quality & installation.

Trans., Illuminating Engineering Society, *1945 June, pp. 111-24 :*
The relationship between interior design in building and artificial illumination, by J. W. T. Walsh, D.Sc. Coefficient of utilisation—i.e. the fraction of lumens which reaches working plane, mounting and spacing of fitments, distribution.

Heating & Ventilating Engineer & Jnl. of Air Conditioning, *1945 September, pp. 91-7 :*
Research for the htg. and ventg. engineer. Paper by C. Tasker, Director of Research, Am. Soc. H. and V.E. Discussion on main problems to be answered, outline of American work.

Jnl. Assn. of Engineers & Architects of Palestine (Tel Aviv), *1945 September, pp. 41-2 :*
Measurement of wall temperature. Article in supplement " Bulletin of Prof. Goldberg's laboratory for precision work." No. 2.

Jnl., Institution of Heating & Ventilating Engineers, *1945 Sept.-Oct., pp. 147-62 :*
Trends in the design of heating installations for domestic purposes. Paper by Sir A. C. G. Egerton, F.R.S. Fuels compared ; national demand ; desirable conditions, insulation problems.

Jnl., Institution of Heating & Ventilating Engineers, *1945 July-August, pp. 121-44 :*
Heating by electrode boilers without thermal storage. Paper by J. Jamieson, illusd. from hospital installation.

Pencil Points, *1945 October, pp. 93-7 :*
Radiant heating layout simplified. Article in " Materials & methods " series by R. G. Vanderweil. Heat flow in rooms : layout of r.-heat system : piping & installation.

National Builder, *1945 October, pp. 59-63 :*
Radio frequency heating. Article on r.f.h. with some reference to possibilities for domestic use in cooking & in production of building industry commodities.

Architect & Building News, *1945 September 28, pp. 201-2 :*
The position of district heating in Britain : economic and technical opportunities.

Air Treatment Engineer, *1945 November, pp. 256-8 :*
Comparative quantitative studies of bacteria in air of enclosed places. Abridged report for New York City Dept. of Health. Types of bacteria quantitative analysis.

Architecture Chronicle (Moscow), *1945 April :*
Exterior decoration of buildings : account of work of Ext. decorations Laby. of Academy of Architecture. Painting, sprayed finishes of quartz & sands.

Keystone (Assn. of Bdg. Technicians), *1945 September, pp. 11- :*
Decorative anodising. Article by G. O. Taylor, multi-colour printing on metals, etc.

Pencil Points, *1945 August, pp. 93-5 :*
The architect and television, by M. J. Alexander. Short article, largely on type of equipment.

PROOFING

Illustrated Carpenter & Builder, *1945 Oct. 12, p. 1126 :*
Keeping out the burglar : positive door block (between facing style and pilaster recess) ; by T. P. Briggs.

Jnl., R.I.B.A., *1945 Sept. 1, pp. 315-21 :*
Fire grading of bldgs. : A.S.B. paper by R. C. Bevan, B.Sc., illusd.

Pencil Points, *1945 August. Building Product Facts supplt. :*
Damp-proofing for masonry walls above grade : causes, precautions, bibliog.

Civil Engineering, *1945 October, pp. 229-32, 234 :*
Earthquakes and earthquake-resisting structures : paper by Juan Kulik, trans. from La Ingenieria by R. Hammond A.M.I.C.E. Intensity of shock measurement, types of structures, foundation problems, materials.

Jnl., R.I.B.A., *1945 August, pp. 290-2 :*
Heat conservation in small houses. Paper to Archl. Science Board, by A. F. Dufton of Bdg. Research Stn.

Jnl., R.I.B.A., *1945 August, pp. 283-94 :*
Methods of construction of heat insulation in the Ukraine, trans. extract from " Dwellings of the people in the Ukraine," by P. G. Yurchenko, with special ref. to wattle and daub and timber constns. Illusd.

A.R.P., WAR DAMAGE (including REPAIR)

Builder, *1945 September 14, pp. 217-8 :*
The work of the War Damage Commissioner. Summary, inc. statistics of war damaged properties.

Jnl., R.I.B.A., *1945 Sept., pp. 325-30 :*
The condition of the monuments of France : report of the War Office on southern and north-western France (the former by the Monuments & Fine Arts Officer). Illusd.

Architects' Journal, *1945 Oct. 4, pp. 241-3 :*
Qualified planners : France points the way. Work of French Ministry of Reconstruction. Art. by B. S. Townroe. War damage maps of Paris and France illusd.

ENGINEERING

Teknisk Tidskrift (Stockholm), *1945 September 22, pp. 1027-33 :*
Traffic tunnels in other countries [than Sweden]. Article by Engineers Samuelson & Pålsson. Planning & ventilation & structural data. Bibliog.

L'Architecture Française (Paris), *1945 August, pp. 3-18 :*
Dams. Special no., inc. articles : The place of architecture in conception & realisation of dams. Hydro-electric plant. Illusd.

TOWN & COUNTRY PLANNING

JNL., R.I.B.A., *1945 August, pp. 295-9 :*
Town and country planning. Interim Rept. 8 of R.I.B.A. Reconstruction ctte. Long abstract.

REVISTA DE ARQUITECTURA (Buenos Aires), *1945 March :*
Planning in Britain special number. The bases—Barlow, Scott & Uthwatt Reports. The Ministry of T. & C. planning. County of London Plan, Coventry, Plymouth Plans described.

BYGGMÄSTAREN (Stockholm), *1945 No. 15, pp. 271-90 :*
Present-day English community planning. A survey of plang. Reports, inc. Barlow, Scott, Uthwatt, County of London, Plymouth, Durham, R.I.B.A., Greater London, etc.

JNL., COMMONS, OPEN SPACES AND FOOTPATHS PRESERVATION SOCIETY, *1945 September, pp. 271-83 :*
Requisitioned Land and War Works Act, 1945. Analysis by H. Baker with special ref. open spaces and commons. Also summaries of Housing (Tempy. Accom.) Act, 1945, Forest Act and Water Act.

L'ARCHITECTURE D'AUJOURD'HUI (Paris), *1945 May-June, pp. 1-16 :*
The reconstruction of France. Articles by Vago, Claudius, with sketch social & geo-physical, communications maps analysing land of France. Article " Introduction to a study of the organisation of land use " by le Corbusier.

LA RICOSTRUZIONE EDILIZIA (Rome, Consiglio Nazionale delle Ricerche) [*1945 Apl., first unnumbered issue*] :
This first issue of this new Italian journal has been received and future issues are expected. The first issue includes articles on the problem of reconstruction in Italy, generally, on prefabn. and standardisation.

ARCHITECTURAL REVIEW, *1945 November, pp. 126-34 :*
The American planning tradition. Part 2 of article by Chr. Tunnard. The evolution of modern planning from *c.* 1900. New profession of " city planners " : conservation of natural resources. " Suburban utopias." Farm community plg. The democratic pressure.

BUILDER, *1945 September 14, pp. 212-4 :*
The architect's part in town and country planning, by W. H. Ansell.

REGIONAL PLANNING

WERK (Zürich), *1945 March, pp. 65-70 :*
Regional planning : the influence of climatic and physical conditions on house and town. Article by E. Egli. Tropical and arctic conditions analysed with reference to planning and orientation of buildings and towns, traditional and projected. Illusd.

ARCHITECTS' JOURNAL, *1945 Oct. 11, pp. 259-62 :*
T.V.A. 1944-45 (? 1943-44) progress report. Key plans and views.

JNL., CHARTERED SURVEYORS' INSTITUTION, *1945 Sept., pp. 114-8 :*
County of London plan : art. by C. H. Walker [*L.*].

JNL., LONDON SOCIETY, *1945 Sept., pp. 14-22 :*
Plan for Greater London : address by Sir Patrick Abercrombie to London Society.

OFFICIAL ARCHITECT, *1945 September, pp. 442-53 :*
Abstract of Greater London Plan, 1944, by Abercrombie, for Ministry of Town and Country Plg.

ARCHITECTS' JOURNAL, *1945 November 1, pp. 313-27 :*
Greater London Plan : an analysis of Sir P. Abercrombie's scheme by E. C. Kent and F. J. Samuely asking 6 main questions regarding relation to national plan, preservation of regional character, organic development, private life of citizen, collective needs, practicability. Illusd.

JNL., INSTN. OF MUNICIPAL & COUNTY ENGINEERS, *1945 Oct. 2, pp. 73-84 :*
Introd. to the Manchester regional and city tentative planning proposals : short paper by R. Nicholas, city surveyor, at Planning Exhibition, and discussion.

TOWN PLANNING & RE-PLANNING

PLAN (Zürich), *1945 Sept.-Oct., pp. 101— :*
Community factors in town planning. Articles " How does the community come into a building plan ? " by M. Werner, inc. chart of planning organisation & process. " What does the community learn about a scheme ? "—public relations of planng.

LOCAL GOVERNMENT SERVICE, *1945 Oct., pp. 415-6 :*
Schoolboys learn civics through practical town planning : by R. South & H. Quinton, of Windsor County boys' school. Replanning of Windsor as test.

ARCHITECTS' JOURNAL, *1945 November 8, pp. 346-7 :*
Social surveys & town planning. Abstract of paper by Dennis Chapman.

L'ARCHITECTURE D'AUJOURD'HUI (Paris), *1945 May-June, pp. 21-3 :*
Town planning and architecture by Lurçat. The impact & synthesis of two disciplines.

JNL., CHARTERED SURVEYORS' INSTN., *1945 Sept., pp. 118-22 :*
City of London plan : abstract of letter and Appendix from Minister T. & C.P. to City Corporation.

ARCHITECT & BUILDING NEWS, *1945 November 2, pp. 80-2 :*

THE BUILDER, *November 9, pp. 366-7 :*
Gravesend. Development scheme for central area inc. Thames water front. Planning officer G. E. Hill, A.M.Inst.C.E. (Br. :) Reviewed by Dr. Lanchester.

ARCHITECTS' JOURNAL, *1945 September 13, pp. 187 :*
Plymouth plan. A critical review, by Sir Charles Reilly.

ARCHITECTS' JOURNAL, *1945 October 18, pp. 277-86 :*
Wolverton, Beds, Urban district plan by G. A. Jellicoe, fully described & illustrated. Landscape plan for whole area, inc. tree-planting scheme, housing estate, recreation centre.

ARCHITECTS' JOURNAL, *1945 September 6, pp. 169-72 :*
Manchester planning scheme, by R. Nicholas, reviewed by J. Blanco White [*A.*].

BUILDER, *1945 September 21, pp. 234-5 ;*

BUILDING INDUSTRIES, *Oct. :*
Manchester and district town planning. Paper to R.I.B.A. conference, by R. Nicholas, M.T.P.I., City Surveyor.

JNL., TOWN PLANNING INSTITUTE, *1945 Sept.-Oct., pp. 210-30 :*
Manchester City Plan described by R. Nicholas, City Surveyor, and Regional Plan by J. J. Brooks, Principal Plg. Asst.

ARCHITECT AND BUILDING NEWS, *1945 October 19, pp. 38-9 :*

BUILDER, *October 19, pp. 305-7 :*
Middlesbrough Plan, by Max Lock. Exhibition at RIBA. Reviewed & illusd.

REVISTA NACIONAL DE ARQUITECTURA, *1945 April, pp. 101-74 :*
General plan for Toledo. A fully detailed development and zoning plan described at length and illustrated by several large maps, diagrams and illustrations.

L'ARCHITECTURE D'AUJOURD'HUI (Paris), *1945 May-June, pp. 40-4 :*
Town planning & reconstruction in Tunisia.

L'HOMME ET L'ARCHITECTURE (Paris), *1945 July-August, pp. 39-42 :*
Algiers plan by le Corbusier.

L'HOMME ET L'ARCHITECTURE (Paris), *1945 Sept.-Oct., pp. inset :*
Rakotoville, Madagascar. Study for plan of sub-tropical town of 10,000 people by Emery & Roux.

ARCHITECTURAL FORUM, *1945 October, pp. 102-16 :*
Atom City. Planning & architecture of Oak Ridge, Tenn. by Skidmore, Owings & Merrill ; city of 75,000 for atom bomb factory. Biggest job of quick town building ever attempted. Housing in association with John Pierce Fdn. & T.V.A. Town centre ; shopping & community facilities ; libraries ; cinemas, recreation centres, schools. Plan & bdgs illusd.

BUILDING, *1945 November, pp. 284-7 :*
U.S.S.R. : one hundred new towns to be built within 5 years. Article by Shchusev. Illusd. by pre-war bdgs.

ARCHITECTURAL DESIGN & CONSTRUCTION, *1945 November, pp. 266-8 :*
Reconstruction of small towns in the USSR. Article by A. Markov on Podolsk. Dwelling types illusd.

JNL., TOWN PLANNING INSTITUTE, *1945 Sept.-Oct., pp. 193-207 :*
The garden-city movement : a revaluation by F. J. Osborn. Howard's original ideas ; the faults in application at Welwyn & Letchworth ; confused planning of 1920-30 ; post-war schemes & Howard idea.

JNL., CHARTERED SURVEYORS' INSTITUTION, *1945 Aug., pp. 77-9 ; Oct., pp. 168-75 :*
Distribution of Industry Act, 1945 ; by H. W. J. Powell.

ZONES, including RESIDENTIAL AREAS

AMERICAN CITY, *1945 August, p. 87 :*
Shopping centre project, by H. S. Churchill, with covered market, car parks.

ARCHITECT & BG. NEWS, *1945 Oct. 12, pp. 24-5 :*
Planning problems of holiday areas : T. & C.P.A. conference at Ventnor. Opening speech by Minister of T. & C.P., and points from C. Williams-Ellis's.

AMERICAN SCHOOL & UNIVERSITY (Annual), *1945, pp. 35-9 :*
Planning adequate school facilities as an integral part of large-scale housing projects, by W. H. Coleman, of Fed. Works Agency.

AMERICAN SCHOOL & UNIVERSITY (Annual), *1945, pp. 40-53 :*
Education and the evolving city. Article by Clarence Stein on community centres and schools development and town planning. Illusd. London, Radburn, Greenbelt, etc. Community centres, Palo Alto, Woodville, Calif., etc.

WERK (Zürich), *1945 June, pp. 167-82 :*
Reconstruction and the problem of emergency housing. Article by Roth with detailed consideration of the planning of devastated areas, temporary housing. Illustg. houses, tempy. hospitals, schools.

ARCHITECT & BUILDING NEWS, *1945 September 14, pp. 166-8 ;*

ARCHITECTS' JOURNAL, *September 20, p. 216 ;*

BUILDER, *September 14, pp. 214-6 :*
The amenities of living—the house and the neighbourhood. Paper by L. H. Keay, City archt., Liverpool. Size of neighd. units, lay-out, etc.

JNL. ROYAL SANITARY INSTITUTE, *1945 Oct., pp. 257-63 :*
Influence of housing needs on the planning scheme, by R. L. Stirling, Lincoln District Planning Officer, and discussion.

JNL. INSTN. OF MUNICIPAL & COUNTY ENGINEERS, *1945 Oct. 2, pp. 111-141 :*
Residential redevelopment : long statistical paper by G. Sutton Brown, principal assistant, Manchester city surveyor's dept., to Planning Exhibition. Tables, density plans, specimen area (Miles Platting). Discussion.

ARCHITECT AND BUILDING NEWS, *1945 October 26 :*
The Re-planning of Hackney by F. Gibberd in collbn. with G. L. Downing, Boro' Engr., and W. G. N. Goodwin, Housing manager. Housing estate, neighbourhood plg. with flats and small houses, libraries, shops, etc. Factory estate, inc. flatted factories. Civic centre, inc. medical centre and central library with plans of latter.

ARCHITECT AND BUILDING NEWS, *1945 October 26, pp. 66-7, 56-7 ;* BUILDER, *October 26, pp. 332-3 :*
Development on Crown land, Regent's Park. A proposal for housing prepared for the S. Pancras Labour Party. With discussion at meeting held at R.I.B.A.

NATIONAL HOUSE BUILDER AND BUILDING DIGEST, *1945 September, pp. 25-9 :*
A warning to planners : the story of Honor Oak Estate, by R. Glass and L. E. White. L.C.C. estate built 1933-7 lacking social amenity or integration with neighbourhood life.

ARCHITECTS' JOURNAL, *1945 November 22, pp. 375-80 :*
Gorhambury Estate, Hertfordshire, replanned. 1800 acre estate : physical & demographic survey & development proposals for housing & farming, by Assn. for Planning.

SITE PLANNING

BUILDING, *1945 Oct. 2, pp. 266-9 :*
Terraced bungalows : illusd. art. by Walter Segal. Narrow-frontage L-plan type.

L'ARCHITECTURE D'AUJOURD'HUI (Paris), *1945 May-June :*
Urban density : theoretical study of various densities (40 to 900 per hectare) town plg. service of Commissariat of Education & Youth of Provisional Govt. in Algiers, 1944, by Roux and Sive. Illusd. diags.

TRANSPORT PLANNING

JNL., INSTN. OF MUNICIPAL & COUNTY ENGINEERS, *1945 Oct. 2, pp. 85-110 :*
City highways : long statistical paper by A. S. Hamilton, Manchester Deputy City Surveyor & Engineer, to Planning Exhibition ; with special reference to Manchester. Tables, Manchester plans. Discussion.

ARCHITECTURAL FORUM, *1945 September, pp. 125-9 :*
Detroit " expressway " system, by engineer W. E. Andrews. Projects for arterials inc. traffic fly-overs, etc. : links with rail system.

GARDENS, CEMETERIES

L'ARCHITECTURE FRANÇAISE, *1945 July, pp. 11-14 :*
Garden art and reconstruction by A. Andrias, landscape archt. Urban parks & gardens illusd.

ARCHITECTS' JOURNAL, *1945 Oct. 4, p. 244 :*
Cremation cemeteries save land : H. Gottesacker's scheme for Basle. Aerial view.

PRESERVATION OF AMENITY

ARCHITECTS' JOURNAL, *1945 September 27, pp. 225- :*
" The blue belt " : coastal preservation and planning. 1st article on survey of G. Britain shores, by J. A. Steers, univ. lecturer in geography, Cambridge, made for Ministry of Town and Country Plg. Reptd. from *Royal Geographical Soc. Jnl.*

NOTES FROM THE MINUTES OF COUNCIL MEETINGS

MEETING HELD ON 11 DECEMBER 1945.

President-in-Chief of the Institute of South African Architects

Mr. B. St. C. Lightfoot [*A.*], President-in-Chief of the Institute of South African Architects, who was on a visit to this country, attended the meeting as one of the representatives of his Institute. The representative in this country is Mr. E. Berry Webber [*A.*].

Honorary Fellowship

The Secretary reported that the Archbishop of Canterbury had accepted nomination as an Honorary Fellow.

Mr. Basil M. Sullivan

Owing to ill-health Mr. B. M. Sullivan tendered his resignation as chairman of the Board of Architectural Education, member of the Council, Executive Committee and other R.I.B.A. Committees. The Council with very deep regret accepted Mr. Sullivan's resignation.

Appointments

B.S.I. Sub-Committee SF/13/2 Solid Fuel Cookers and Combustion Grates : Lieut.-Col. H. V. Kerr [*F.*].

Professional Text and Reference Books Committee : Miss Enid Caldicott, Mr. J. Murray Easton [*F.*], Mr. Robert Jordan [*F.*], Mr. J. E. Marshall [*F.*], Professor A. E. Richardson [*F.*].

Practice Committee : Mr. R. B. Craze [*F.*].

Public Relations Committee : Exhibitions Sub-Committee : Mr. Philip Powell [*A.*], Mr. Hilton Wright [*A.*], Mr. Eric Brown [*L.*].

Public Relations Committee : Press and Publications Sub-Committee : Lieut.-Col. E. D. J. Mathews [*A.*], Mr. Kenneth Campbell [*A.*], Mr. Richard Henniker [*A.*].

Town and Country Planning Committee : Mr. Robert Atkinson [*F.*].

Library Committee : Mr. W. H. Ansell [*F.*], Mr. H. M. Fletcher [*F.*], Mr. M. S. Briggs [*F.*], Mr. Graham Tubbs [*A.*], Mr. John Summerson [*A.*], Mr. W. A. Allen [*A.*], Mr. R. L. Townsend [*A.*], Mr. Charles Woodward [*A.*], Mr. S. Rowland Pierce [*F.*], Mr. R. B. Craze [*F.*], Mr. R. S. Nickson [*F.*].

Foreign Relations Committee : Mr. J. S. Walkden [*F.*] (representing the Board of Architectural Education).

Board of Architectural Education : Lieut.-Col. V. H. Seymer [*A.*] (in place of Mr. C. S. White).

Schools Committee : Mr. Kenneth Cross [*F.*] (in place of Mr. A. G. Ling).

The Council, on the recommendation of the Board of Architectural Education, appointed the following :—

Committee of Moderators and Examiners for 1946.

Examinations Committee.

Prizes and Scholarships Committee.

On the recommendation of the Board of Architectural Education the Council appointed the Juries for the Prizes and Studentships for 1946-47 and approved revised conditions of entry resulting from the war.

Architectural Science Board : Mr. P. L. Rees [*A.*], Mr. Donald McIntyre [*A.*].

Architects' Registration Council : Mr. M. S. Briggs [*F.*] (in place of Mr. B. M. Sullivan).

The War Damage Act and its Effect upon Planning

The Council, on the recommendation of the Town and Country Planning Committee, agreed to support the Association of British Chambers of Commerce and the Association of Municipal Corporations in any efforts to secure legislation which would allow a " cost of works " payment to be made where, in the interests of planning, it is necessary for a building to be rebuilt on a new site.

Easements of Light and the Rebuilding of War Damaged Buildings

The Council appointed an *ad hoc* Committee to consider and report on the whole subject of easements as affecting planning.

Scale of Fees for State-aided Housing Schemes

It was agreed to ask the Chartered Surveyors' Institution for sanction to publish with the R.I.B.A. Scale of Fees for State-aided Housing Schemes, the C.S.I. Scale for Quantity Surveyors' services in connection with Housing Schemes.

Practice Lectures

The Council approved proposals drawn up by the officers of the Board of Architectural Education and the Public Relations Committee for Practice Lectures and Lectures on Office Organisation to be given at the R.I.B.A. and possibly at the Recognised Schools.

The Future of the Journal

The report of the Special Committee on this matter was approved and the necessary staff changes in connection with the JOURNAL, Library and Public Relations work were agreed.

Royal Gold Medal

It was unanimously agreed to submit the name of Professor Sir Patrick Abercrombie [*F.*] to His Majesty the King as a suitable recipient of the Royal Gold Medal for 1946.

Membership

The following members were elected:—As Hon. Corresponding Member, 1; as Fellows, 12; as Associates, 18; as Licentiates, 14.

Election 12 February 1946

Applications for election were approved as follows:—As Fellows, 7; as Associates, 7; as Licentiates, 17.

Election 7 May 1946

Applications for election from overseas candidates were approved as follows:—As Fellows, 4; as Associates, 4.

Reinstatements

The following ex-members were reinstated:—As Associates, Ralph Dickinson, Barry Brook Learoyd, Thomas Henry Mace; as Licentiate, Seth Stephens.

Applications for Transfer to Retired Members' Class under Bye-law 15

The following applications were approved:—As Retired Fellows: Ronald Potter Jones, William Campbell Jones.

Obituary

The Secretary reported with regret the death of the following members and Students:—

Paul Philippe Cret (H.C.M.).
Mr. Cret was an Officer de la Legion d'Honneur, also Gold Medallist of the American Institute of Architects.
Charles Ernest Monro [*F.*].
Ronald William Higgs [*A.*]. Killed on active service.
William Edward Field Johns [*A.*]. Killed on active service.
Charles Hatton Short [*A.*].
James Dorward [*L.*].
Victor Hugh John [*L.*].
Gilbert Oswald [*L.*].
William John Wakely [*L.*].
Augustus Michael Burnand Hughes [*S.*]. Killed on active service.
Brian John O'Leary [*S.*].
Peter Lewis Thorne [*S.*]. Killed on active service.
Hubert Wills Woodnoth [*S.*]. Killed on active service.

MEETING HELD ON 12 FEBRUARY 1946

Membership of the Council

Mr. J. T. Saunders [*F.*], representative of the Berks., Bucks. and Oxon Architectural Association, has resigned his membership of the Council, and Mr. R. G. Brocklehurst [*F.*], President of that Association, has been appointed in his place.

Appointments

Professional Text and Reference Books Committee: Miss Enid Caldicott, Mr. J. Murray Easton [*F.*], Mr. Robert Jordan [*F.*], Mr. J. E. Marshall [*F.*], and Professor A. E. Richardson [*F.*].

Architects Registration Council of the United Kingdom: Mr. Darcy Braddell [*F.*], Mr. Martin S. Briggs [*F.*], Mr. R. Gordon Brown [*A.*], Mr. A. C. Bunch [*F.*], Mr. Cecil Burns [*F.*], Mr. A. M. Chitty [*F.*] Mr. R. B. Craze [*F.*], Mr. J. L. Denman [*F.*], Mr. A. B. Knapp-Fisher [*F.*], Lieut.-Colonel E. D. J. Mathews [*A.*], Mr. A. L. Roberts [*F.*], Lieut.Colonel V. H. Seymer [*A.*], Mr. H. G. C. Spenceley [*F.*], Mr. Sydney Tatchell [*F.*], Mr. F. C. Wakeford [*L.*], Mr. Michael Waterhouse [*F.*], and Mr. F. R. S. Yorke [*F.*].

Admission Committee, A.R.C.U.K.: Mr. R. B. Craze [*F.*], Mr. Denis Poulton [*A.*], Mr. A. T. Scott [*F.*], Mr. Wilfrid Woodhouse [*A.*].

Tribunal of Appeal under the London Building Acts (Amendment) Act 1939: Sir Banister Fletcher [*F.*] (Mr. Charles Woodward [*F.*] (deputy)).

Architectural Education Committee, University of London: Mr. A. B. Knapp-Fisher [*F.*], Mr. Martin S. Briggs [*F.*].

Ministry of Works Standard Hutting for Schools

The Council approved the action of the President and Executive Committee in directing that the report of the Committee on School Design and Construction on Ministry of Works Standard Hutting for Schools should be given wide publication.

Osterley Park

The Council approved the acceptance of an invitation from the National Trust that the President in office should serve as a trustee of Osterley Park.

The Honorary Associateship

The Council have invited Sir Edward Appleton, K.C.B., D.Sc., LL.D., F.R.S., Secretary of the Department of Scientific and Industrial Research, to accept nomination for the Honorary Associateship.

Membership

The following members were elected:—

As Fellows 7; as Associates 7; as Licentiates 17.

Election 9 April 1946

Applications for election were approved as follows:—

As Fellows 4; as Associates 4; as Licentiates 19.

Election 9 July 1946

An application from an overseas candidate for election as an Associate was approved.

Application for Reinstatement

The following applications for reinstatement were approved:—

As Fellows: Edward Noel Clifton
Thomas Frank Hawkes
Robert Pierce [*A.*]
As Associates: Christopher John Brooks
George Edward Phillips
William Charles Powell.

Resignations

The following resignations were accepted with regret:—

John Spedding Curwen, O.B.E., J.P. [*F.*].
Leonard John Brown [*A.*].
Gerald Wanklyn Flower [*A.*].
Hendrik Jacobus Louw [*A.*].
Herries Stirling Maxwell [*A.*].
Herbert Cescinsky [*L.*].
Malcolm Mactaggart [*L.*].

Retired Members

The following applications for transfer to the Retired Members' Class under Bye-law 15 were approved:—

As Retired Fellows: John Acheson Charles.
Norman Richley.
William Harding Thompson.
As Retired Associate: Alfred Ernest Holbrow.
As Retired Licentiate: George Povey.

Obituary

The Secretary reported with regret the death of the following members and Students:—

Captain Ludovic Gordon Farquhar, M.C. [*F.*].
Patrick Hill Thoms [*F.*]. Mr. Thoms was a past member of the Council.
George Harry Wenyon [*F.*].
Herbert Henry Dunn [*Retd. F.*].
John Stewart, M.B.E. [*Retd. F.*].
Francis Cecil Dobson [*A.*]. Killed on active service.
Daniel Roy Lyne, M.C. [*A.*].
Harold Seymore Scott [*A.*].
John Archibald [*L.*].
John Bevir [*L.*].
Frederick Malcolm Burr [*L.*].
William David Morgan [*L.*].
John Henry Fraser Steward [*L.*]. Killed on active service.
John Edwin Harrison [*Retd. L.*].
William Allan [*Student*].
Ian Malcolm MacPhee [*Student*]. Killed on active service.

ARCHITECTURAL SCIENCE BOARD LECTURE

Wednesday, 3 April 1946, at 5.45 p.m.

"COLOUR IN BUILDINGS,"

By William Allen, B.Arch, A.R.I.B.A.

Recent papers arranged by the Architectural Science Board have discussed painting, plastering and painting on plaster. The present paper attempts an objective study of colour as used by the designer.

Three main lines of approach in present-day colour practice are noted:

1. The light-coloured environment.
2. The use of more striking colours.
3. Utilitarian uses of colour.

It is noted that the first two of these have been successively advocated among building designers, while the third—largely a matter of colour in factories at present—has most of its current inspiration in science.

All three are examined, particularly to see why they have been advocated, and to discover what scientific evidence can be found on which to base criticism. This is shown to consist mainly of the following:

1. The nature of the visual reaction to different forms of brightness-contrast.
2. The effect of recession and of camouflage.
3. The nature of what we call "texture" or "richness" and its importance as a principle of decoration.

The effect of colour on the morale of operatives in factories is mentioned, and some questions are raised about future practice in factory colouring.

To develop the discussions which take place at the lectures, it has been decided to print the papers for circulation before the date on which they are to be given. Copies of the lectures may be obtained two weeks before they are due to be delivered, on application to the Editor, R.I.B.A. Journal, 66 Portland Place, W.1. A register is kept at the R.I.B.A. of those who ask for copies of lectures or who express themselves interested in any particular lecture.

Correspondence

L.O.W. STANDARD HUTTING FOR SCHOOLS

DEAR SIR,—My attention has been drawn to the report of the Committee on School Design and Construction in the February JOURNAL. To avoid any misunderstanding, I think the comparison in Section 4 of the Report between standard hutting and the suggested permanent prefabricated construction should have included the following :

"For the purpose of this comparison it is assumed that irrespective of construction, the following requirements would be similar :

(1) Plan of Building.
(2) Floor Levels.
(3) Finishings generally, i.e., floor coverings, internal partition walls and finishings, doors, windows, etc.
(4) Heating and electrical installations and gas services.
(5) Outside pavings, fencings and gates."

I think that the omission of this information is liable to confuse.

The other point is that the roof trusses are at 11 ft. centres, not 12 ft. as stated.

Yours sincerely, HOWARD LOBB [*F.*].

SALISBURY TOWER AND SPIRE

To the Editor, JOURNAL R.I.B.A.

SIR,—Mr. W. A. Forsyth's article on Salisbury tower and spire in your January issue is not only of absorbing interest : it is also a complete vindication of the mediæval architect by a modern colleague of unrivalled experience. The picturesque theories of monks and ignorant villagers piling stone on stone to the glory of God, or of a mysteriously inspired hive of folk-artists find no support in the series of structural facts so clearly described by Mr. Forsyth, and shown on his admirable drawings (one regrets they could not be published on a much larger scale). Excellent masonry, pared down to a 9-inch thickness in the spire, an elaborate system of "secret" flying-buttresses introduced into the earlier walls of the church beneath, and hidden reinforcement of wrought iron, still in service after six centuries of stress and rust, all bear witness to a high degree of initiative and skill in the architect who designed this amazing feat of construction and art.

Fortunately, there is other evidence as to the skill and importance of the designer. On 16 December 1331 the Bishop and Dean and Chapter of Salisbury were granted the stone walls of the cathedral of Old Sarum "for the improvement of the church of New Sarum" and for the building of the walls of the close. (*Calendar of Patent Rolls*). At this time the cathedral mason was one Robert, apparently identical with that "Robertus cementarius" whose obit was kept in August and who "rexit xxv annos." (Leland). He must have been an old man, and the vast project was beyond his powers, for the Chapter engaged the services of a distinguished consultant, already engaged on works as far apart as Bath and Reading. This was Richard Farleigh, who in July 1334 was entrusted with the custody of the fabric, and the selection and supervision of masons and other workmen. He was to visit Salisbury from time to time as the work should require, and stay for as long as was needful. His works at Bath and Reading were not to be the excuse for neglect or delay at Salisbury, and in addition to a salary of sixpence for every day he should be present at the work, he was promised the additional fee of ten marks (£6 13s. 4d.) yearly, if he should survive Robert the mason, the then grantee. (Dodsworth : *Salisbury Cathedral*, 1814, p. 151).

His work at Bath was doubtless part of the old Abbey buildings, now destroyed, for on 30 April 1335 the Prior of Bath similarly rewarded "Master Richard de Farlegh" with the reversion to a corrody then enjoyed by William Averay, of Cruddewell (*Somerset Record Soc.*, VII, p. 171). At Reading he may have had charge of the building of the Abbey Lady Chapel, and it is not unlikely that he was the Master Richard of Reading who was paid £3 6s. 8d. for making by task-work two statues for the gable of St. Stephen's Chapel in Westminster, in 1333. (Brayley & Britton : *Palace of Westminster*, 1836, p. 157 ; *cf.* Topham : *An Account of the Chapel of St. Stephen*, 1834.) It was still customary for the mason-architects of the fourteenth century to be expert sculptors.

At Salisbury, besides his masterpiece, Farleigh perhaps designed the charming gate-chapel of St. Anne, which was said to be "newly constructed" in 1354 (*Calendar Papal Letters*, III, p. 538), and he evidently prospered, for in 1360 and 1363 "Richard de Farleygh, mason" and Margaret his wife were engaged in disposing of six messuages, 16 acres of land and three acres of meadow in Keynsham, Somerset. (*Somerset Feet of Fines*, 1347-99, 46). Monkton Farleigh, close to Bath, was probably the origin of his family. To his known works the late Mr. F. B. Andrews added on stylistic grounds the tower of Pershore Abbey, which might indeed be the first essay in design from which sprang the noble tower of Salisbury. (*Birmingham Archaeol. Soc.*, LVII, p. 9).

Here, then, is an imposing figure, known to us from some scanty documents, and by the most daring architectural work this country has yet seen ; the first English architect, apart from civil servants, who is known to have had a widely-spread practice, and the first to make extensive use of concealed metal reinforcement. A gross offender against the Ruskinian canons of Truth, as Bach against the strict rules of counterpoint, may we not say of Master Richard Farleigh, that the tree was justified by its fruits ?

JOHN H. HARVEY.

ROYAL ENGINEERS WAR MEMORIAL

To the Editor, JOURNAL R.I.B.A.

DEAR SIR,—I have been asked by the Chairman of the R.E. War Memorial Fund, Lt.-General Sir J. Ronald E. Charles, K.C.B., C.M.G., D.S.O., the Chief Royal Engineer, if I can, as a Member of the Committee, get the attached notice inserted in the R.I.B.A. JOURNAL, as the Committee are anxious that all members who have served in the Royal Engineers and who have not received notice through the units in which they have served should be aware of the Fund.

Yours sincerely,
A. L. ABBOTT [*F.*].

ROYAL ENGINEERS WAR MEMORIAL

Notice to all Members of the Royal Institute of British Architects who have served in the Royal Engineers

The Corps of Royal Engineers have decided to provide a War Memorial to commemorate the deeds of the Corps in the Second World War and to honour those who have fallen. An appeal for subscriptions has been circulated to all units in the Corps, but it is certain that it did not reach many before they returned to civil life.

It is intended to provide a memorial of a beneficent type, such as cottage homes for the disabled, a convalescent home, or endowed beds in hospitals, from which ex-soldiers of the Corps can benefit.

It is hoped that members of the Royal Institute of British Architects who served in the Royal Engineers and have not already subscribed will avail themselves of this opportunity of contributing towards a Memorial which will stand for all time to commemorate our gallant comrades who made the supreme sacrifice. Subscriptions should be sent to The Honorary Treasurer, Royal Engineers War Memorial Fund, Gibraltar Barracks, Aldershot.

SCIENCE IN ARCHITECTURE

The following comments on Professor Bernal's paper have been received from Professor A. L. L. Baker, of the Imperial College of Science and Technology.

Professor Bernal put with admirable clarity the case for scientific method and research in building and the excellent work now being carried out by the Ministry of Works and Building Research Station undoubtedly has the strong support of all progressive architects and builders. A house designed internally as "an efficient machine for living in" would be generally welcome except perhaps that an inefficient open fire is preferable in the opinion of most English people to a scientifically designed heating panel.

But the view of other scientifically designed houses through the window is another matter and rather depressing to contemplate. It is now almost generally accepted that even a well designed chemical works can be beautiful, but this type of cold efficient "streamlined" beauty, unquestionably desirable in a factory or liner, does not symbolise the chief function of a home which is built to contain the human jumble of family life. Some attempt, therefore, should be made to express externally the essential, friendly, uncalculating atmosphere of a home in which adults can relax and children play. It perhaps is time that we had a change from the present methods of superficial æsthetic treatment, usually a mixed assortment of gables, vertical tiling and half timber construction, but it must be done without loss of charm.

The majority of the nation can only be decently housed, in the opinion of engineers, by mechanising building methods and using large construction units. Standardised prefabricated houses in large numbers will always be depressingly ugly unless grouped together in a composite plan. It is not difficult to design a block of flats or a housing estate using large standard floor and partition units, but so far no one has produced an attractive elevation composed of large wall units, say 8 ft. by 15 ft. This seems to be one of the major problems for architects to solve.

NOTES AND NOTICES

MEMBERS FROM JAPANESE P.O.W. CAMPS

Information has been received that the following members have been released from Japanese hands and are safe and well :—

W. F. G. Heath [*A.*].

C. E. Hopkins [*A.*].

D. G. Mirams [*A.*].

B. N. Weekes [*F.*].

A. M. J. Wright [*A.*].

MEMBERS SERVING WITH THE FORCES

DECORATIONS

Ansell, E. L. [*A.*], Major R.E. Awarded M.B.E.
Bailey, D. C. [*A.*], Lt. Col. R.E. Awarded O.B.E. and Bronze Star (U.S.A.)
Bell, James, M.B.E., T.D. [*A.*], Major R.E. Awarded D.S.O.
Duckett, Basil G. [*A.*], F/Lt. R.A.F. Awarded D.F.C.
Gifford, R. C. [*A.*], Major R.E. Awarded M.B.E.
Hall, Wm. Rowley [*A.*], Capt. R.E. Awarded the Efficiency Decoration.
Lumb, Arthur [*A.*], Lieut. R.E. Awarded M.B.E.
MacKellar, Robert [*S.*], Major R.E. Awarded M.B.E.
Newton, E. A. [*S.*], Lieut. R.E. Awarded M.B.E.
Parsons, L. H. [*A.*], Major R.E. Awarded M.B.E.
Toplis, G. M. [*A.*], Lieut. R.N.V.R. Awarded D.S.C.
Torrens, R. Michael [*A.*], Major R.E. Awarded M.B.E.
Warwick, Ian F. [*A.*], Major R.E. Awarded M.B.E.

COMMENDED FOR VALUABLE WAR SERVICE

Slade, C. J. [*A.*], Capt. South African Engineering Corps.

MENTIONED IN DESPATCHES

Alliston, J. T. [*F.*], Lieut.-Col. R.E.
Bond, L. H. [*L.*], Capt. R.E.
Carr, F. H. [*A.*], Capt. R.E.
Cooper, C. J. [*S.*], Capt. R.E.
Eker, M. [*A.*], Capt. R.E.
Elder, A. J. [*A.*], Capt. R.E.
Hardy, Ronald [*A.*], Major R.E.
Heppenstall, E. A. [*A.*], Major R.E. (third mention).
Holbrook, L. C. [*A.*], Capt. R.E.
Jones, R. Norman [*S.*], Lieut. R.A.
Lacey, J. S. [*A.*], Lieut. R.E.
Prince, W. H. [*A.*], L/Cpl. R.E.
Redknap, P. H. [*A.*], Major R.E. (second mention).
Smeeton, R. A. [*A.*], Capt. R.E.
Walker, W. T. C. [*A.*], Major R.E.

R.I.B.A. EXAMINATIONS

SPECIAL FINAL EXAMINATION, SALISBURY, SOUTHERN RHODESIA

DECEMBER, 1945

The Special Final Examination was held at Salisbury, Southern Rhodesia, in December 1945, when the following candidate was examined and passed in Part I:

Jack, Alex D.

EXAMINATION OF LICENTIATES TO QUALIFY FOR CANDIDATURE AS FELLOWS

The Examination of Licentiates to qualify for candidature as Fellows was held in London from 5 to 10 December 1945. The successful candidates were:

Allen, Frederick H.
Dick, Douglas L.
Field, Sidney J.
MacGregor, John W.
Mackeith, Charles H.
Mellor, Richard F. M.
O'Neill, George G.
Wright, Arthur G. B.

HEALTH CONGRESS AT BLACKPOOL

The Rt. Hon. Lord Woolton, P.C., C.H., D.L., has accepted the office of President of the Health Congress which is to be held at Blackpool from 3 to 7 June next, by the Royal Sanitary Institute.

The Congress will be divided into sections, dealing with the following subjects, and presided over by those named:

Preventive Medicine—Sir Wilson Jameson, K.C.B., M.A., M.D., F.R.C.P., D.P.H.

Engineering and Architecture—Sir Reginald Stradling, C.B., M.C., F.R.S., D.Sc., M.Inst.C.E.

Maternal and Child Health—The Most Hon. the Marchioness of Reading.

Veterinary Hygiene—Prof. J. G. Wright, M.V.Sc., F.R.C.V.S.

Food and Nutrition—Prof. S. J. Cowell, M.A., M.B., BCh., F.R.C.P.

Housing and Town Planning—Norman H. Walls.

In addition, there will be conferences of medical officers of health, engineers and surveyors, sanitary inspectors, and health visitors. The programmes of these sections and conferences are well advanced, and a further announcement will shortly be made of the subjects to be discussed.

PROBATIONERSHIP OF THE R.I.B.A. SPECIAL APPLICATIONS

After 31 March 1946 all candidates for the Probationership of the R.I.B.A. will be required to submit certificates of having passed recognised examinations, and it will no longer be possible to submit special applications as has been the case for those who started their full-time architectural education or joined the Armed Forces before 30 June 1943.

Special applications may, however, be submitted after 31 March 1946 by applicants serving with H.M. Forces overseas who produce evidence that they have been prevented from making their special applications by 31 March, 1946, by reason of their overseas service.

VICTORY (EX-SERVICES) CLUB APPEAL

An influential committee representing all sections of British industry has launched an appeal for funds to build a social, cultural and welfare centre in London for ex-service men and women. It is to be industry's war memorial to the fallen. The scheme is supported by the Prime Minister, Mr. Churchill, Field-Marshal Montgomery, Air Chief-Marshal Tedder and other senior officers of the Services. The proposed building will contain welfare and advice bureaux, lounges, reading and writing rooms, a restaurant and several hundred bedrooms. Each section of industry has its own appeal committee, the president of the Building Trade Appeal being Sir George Burt. The committee point out that if you sign a covenant to pay to a charity a certain sum each year for seven years, the charity actually gets double the amount while, if you pay surtax you actually benefit because the Government will refund the full amount of surtax chargeable on the amount of the contribution to you. Donations should be sent to the Treasurer, Victory (Ex-Services) Club Appeal Fund and may be paid into any branch of the Westminster Bank. Enquiries should be made to M. A. Browning, 15 King Street, S.W.1.

NOTES ON PRESENT-DAY PRACTICE AND PROCEDURE

Mr. Charles Woodward [*A.*] has prepared for the use of returning service members a series of notes on present-day building practice and procedure. They explain the system of licences and regulations which to-day govern practice and which are strange to members trained in pre-war methods. The notes are issued free on application to members of the R.I.B.A. They will be revised from time to time ; notice of revisions will be given in the Journal ; members wanting revised copies should ask for them because present staff limitations do not permit an undertaking to send out revision sheets unless they are asked for. Non-members can obtain the notes at a cost of 1s.

BUILDING SURVEYING EXAMINATION

The R.I.B.A. Examination qualifying for candidature as Building Surveyor under Local Authorities will be held at the R.I.B.A. on 1, 2 and 3 May 1946. Applications for admission to the examination must be received not later than 15 March 1946.

ANNUAL SUBSCRIPTIONS

Members' subscriptions, Students' and Subscribers' contributions became due on 1 January 1946.

The amounts are as follows :—

Fellows	£5 5 0
Associates	£3 3 0
Licentiates	£3 3 0
Students	£1 1 0
Subscribers	£1 1 0

NOTE.—By a resolution of the Council dated 20 July 1931 the subscriptions of R.I.B.A. members in the transoceanic Dominions who are also members of Allied Societies in those Dominions are reduced to the following amounts as from 1 January 1932 :—

Fellows	£3 3 0
Associates	£2 2 0
Licentiates	£2 2 0

Members who are already registered under the Architects' Registration Act 1931 are reminded that the annual renewal fee of £1 became due on 1 January 1946, and should be forwarded DIRECT to the *Registrar, The Architects' Registration Council*, 68 Portland Place, W.1.

COMPOSITION OF SUBSCRIPTIONS FOR LIFE MEMBERSHIP

Fellows, Associates and Licentiates of the Royal Institute may become Life Members by compounding their respective annual subscriptions on the following basis :—

For a Fellow by a payment of £73 10s. (70 guineas).

For an Associate or Licentiate by a payment of £44 2s. (42 guineas), with a further payment of £29 8s. (28 guineas) on being admitted as a Fellow.

In the case of members in the transoceanic Dominions who are members of Allied Societies in those Dominions, the following basis will operate :—

For a Fellow by a payment of £52 10s. (50 guineas).

For an Associate or Licentiate by a payment of £31 10s. (30 guineas), with a further payment of £21 (20 guineas) on being admitted as a Fellow.

Provided always that in the case of a Fellow or Associate the above compositions are to be reduced by £1 1s. per annum for every completed year of membership of the Royal Institute after the first five years, and in the case of a Licentiate by £1 1s. per annum for every completed year of membership of the Royal Institute, with a minimum composition of £6 6s. in the case of Fellows and £4 4s. in the case of Associates and Licentiates.

ARCHITECTURAL COMPETITIONS

ASSESSORS' AWARDS

All architects who take part in architectural competitions are reminded by the Council of the R.I.B.A. that participation in a competition is a definite acceptance of the principle that the award of the assessor is final and binding upon themselves as well as upon the promoters, and that any competitor who feels that he has real ground for dissatisfaction with an assessor's award should communicate with the Secretary of the R.I.B.A.

Further, all architects, whether competitors or otherwise, are reminded that discussion or correspondence in the public or professional Press which tends to criticism or disparagement of an assessor or award cannot alter the final and binding effect of the award, but may prejudice architects and the whole competition system in the opinion of the public, and is, therefore, highly undesirable.

ASSOCIATES AND THE FELLOWSHIP

Associates who are eligible and desirous of transferring to the Fellowship are reminded that if they wish to take advantage of the next election they should send the necessary nomination forms to the Secretary R.I.B.A. as soon as possible.

R.I.B.A. DISTINCTION IN TOWN PLANNING

The R.I.B.A. Distinction in Town Planning is obtainable by Fellows, Associates (who are not less than 26 years of age) and Licentiates. The test by means of which this Distinction is awarded is conducted by special examiners appointed by the Council of the R.I.B.A.

This award does not take the place of the R.I.B.A. Diploma in Town Planning, which is obtainable by Fellows, Associates and Licentiates of the R.I.B.A. without any minimum age limit.

The primary purpose of the Distinction is to satisfy a demand from architects to take a qualifying test in town planning suited to their age and existing attainments.

The Examiners will meet three times a year—in February, May and October. Applications should be submitted to the Secretary of the R.I.B.A. by 1 January, 1 April and 1 September annually.

Copies of the form of application containing the procedure, regulations, general scope of study and bibliography may be obtained free on application to the Secretary, R.I.B.A.

CORRECTION

HANDBOOK OF EMPIRE TIMBERS

We regret that the price of the Forest Products Research Laboratory's Handbook of Empire Timbers was wrongly stated in the January issue of the JOURNAL. The correct price is 3s., or 3s. 4d. post free.

COMPETITIONS

COMPETITION FOR LAYOUT AND REPLANNING OF THE CRYSTAL PALACE

The Trustees of the Crystal Palace and the Council for the Encouragement of Music and the Arts (C.E.M.A.) invite architects and town-planners to submit designs for the layout of the new Crystal Palace and its surroundings.

Assessors : Prof. Sir Patrick Abercrombie [*F.*]
Dr. Charles Holden [*F.*]
Mr. Alister MacDonald [*F.*]
Sir Kenneth Clark, K.B.E.
Mr. Lewis Silkin, M.P.

Premiums : £2,000, £750, £500, and a further sum of £500 may be awarded at the discretion of the Assessors.

Last day for submitting designs : 6 April 1946.

Conditions of the competition may be obtained on application to the General Manager, Crystal Palace, London, S.E.19. Deposit one guinea.

WESTMINSTER: COMPETITION FOR WORKING-CLASS FLATS

The Westminster City Council invite architects to submit in competition designs for the layout of about 31 acres in Westminster, and for the design of flats to be erected thereon.

Assessor : Mr. Stanley C. Ramsey [*F.*].

Premiums : 700 guineas, 500 guineas, 300 guineas and 200 guineas.

Conditions of the competition may be obtained from the General Manager, Crystal Palace, S.E.19.

Last day for submitting designs : 30 April 1946.

It is the intention of the Promoters to proceed forthwith with the erection of the buildings on one section of the area covering about 8 acres and subject to the Conditions of the Competition to employ for that purpose the author of the winning design at fees calculated in accordance with the R.I.B.A. scale of architects' fees for State-aided multi-storey flats.

Conditions of the competition may be obtained on application to Sir Parker Morris, LL.B., Town Clerk, Westminster City Hall, Charing Cross Road, W.C.2.

Deposit, 3 guineas.

WORKERS' TRAVEL ASSOCIATION: COMPETITION FOR HOLIDAY CENTRES

The Workers' Travel Association invites architects to submit in competition designs for (*a*) an inland holiday centre and (*b*) a coastal holiday centre.

Assessors : Sir Patrick Abercrombie, M.A., P.P.T.P.I. [*F.*], J. H. Forshaw, M.C., M.A., M.T.P.I. [*F.*], C. G. Kemp [*A.*].

Premiums : Two of £250. Two of £100.

Last day for submitting designs : 30 April 1946.

Conditions of the competition may be obtained on application to The Workers' Travel Association, Ltd., 34-36 Gillingham Street, London, S.W.1.

Membership Lists

ELECTION: 12 FEBRUARY 1946

The following candidates for membership were elected on 12 February 1946 :—

AS FELLOWS (7)

CRANE : EDWARD RAY, D.S.C. [*A.* 1935] (Norwich).
DRURY : HENRY MYLES REILLY [*A.* 1928] (Exeter).
DUNHAM : PETER BROWNING [*A.* 1933] (Witney, Oxon).
LANCASHIRE : JOHN EDWIN [*A.* 1927] (Sheffield).
WYNESS : JAMES FENTON, Dip.Arch., F.S.A.Scot. [*A.* 1927] (Aberdeen).
And the following Licentiates who have passed the qualifying Examination :—
THORPE : ALBERT NEWTON (York).
WINBOURNE : HYMAN.

AS ASSOCIATES (7)

BRITTLEBANK : ERIC (Halifax).
FLETT : GEORGE (Findochty, Banffshire).
HALL : THOMAS DAVISON, Dip.Arch. (Hexham, Northumberland).
MCCULLOCH : JOHN EDGAR (Edinburgh).
SCOTT : JOHN (Larne, N. Ireland).
SYDNEY : PHILIP ALGERNON (Wirral, Cheshire).
WILLIAMS : HUGH OWEN (Cardiff).

AS LICENTIATES (17)

BANFIELD : FRANCIS THEODORE.
BROTHERTON : ALAN HARGREAVES (Manchester).
DRAKE : JACK WILLIAM.
ELLIS : ROBERT SOMERVILLE (Edinburgh, 4).
ELMER : JOSEPH HENRY.
FOX : CECIL HENRY [Major R.E.].
GOLDSBROUGH : FRANCIS (Birmingham, 13).
HIND : WILLIAM LIONEL (Harrogate).
LAMB : ANDREW JOHN [Major] (Newcastle-on-Tyne, 4).
LAMBERT : ERIC PERCY (Bridport).
MAYSON : WILLIAM STANLEY (Washington, Co. Durham).
PLUMTREE : HENRY SANDERSON (West Bridgford, Notts).
POOK : FREDERICK JOHN.
TITLEY : PERCIVAL EDWARD (Plympton, S. Devon).
WALKER : RONALD WILLIAM.
WHITE : FRANK SILVESTER [Lieut.-Col.] (Ilkeston, Derbyshire).
YATES : CHARLES HENRY (Chesterfield).

ELECTION: 9 APRIL 1946

An election of candidates for membership will take place on 9 April 1946. The names and addresses of the candidates, with the names of their proposers, found by the Council to be eligible and qualified in accordance with the Charter and Bye-laws, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Monday, 8 April 1946.

The names following the applicant's address are those of his proposers.

AS FELLOWS (2)

BAILLON : LOUIS BRABAZON (*A.*1937), Estate Dept., The Northampton Brewery Co., Ltd. ; Canal House, Blisworth Arm, Northampton. J. S. Harrison, Lieut.-General Sir John Brown and E. J. Williams.

MILLS : EDWARD DAVID WILLIAM (*A.*1937), 127 Cheapside, E.C.2 ; Dacres Lodge, 25 Dacres Road, Forest Hill, S.E.23. Frederick Gibberd, M. H. Thomas and R. F. Jordan.

AS ASSOCIATES (4)

The name of a school or schools after a candidate's name indicate the passing of a recognised course.

COWELL : EDWARD WILLIAM (Major) [Final], 100 Bowhill, Kettering. Charles Riddey and applying for nomination by the Council under Bye-law 3 (*d*).

CURRAN : MICHAEL JOHN [The Sch. of Arch., Univ. Coll., Dublin], 6 High Street, Kilkenny, Eire. Prof. J. V. Downes, Vincent Kelly and P. J. Munden.

GOOD : ARTHUR BERNARD VAUGHAN [The Arch. Assoc.], 24 Frognal Court, Finchley Road, London, N.W.3. Sir Charles Nicholson, Howard Robertson and S. R. Pierce.

MATTHEWS : ALBERT EDWARD (Capt. R.E.) [Final], 30 Sefton Road, East Croydon, Surrey. E. F. M. Elms, J. K. Hicks and Sydney Jupp.

AS LICENTIATES (19)

BEAUMONT : EDMUND ALFRED, Heston Farm, Heston, Middlesex ; 95 Wood Lane, Kingsbury, N.W.9. Joseph Hill, Lieut.-General Sir John Brown and Lieut.-Col. A. E. Henson.

EGLINTON : RONALD WOLLSTEIN, c/o Town Hall, Brixton Hill, S.W.2 ; 64 Staunton Road, Kingston-upon-Thames. S. P. Anderson, J. W. Spink and F. L. Jackman.

FRANKISH : ALFRED, Architect's Department, L.C.C., Westminster, S.E.1 ; 15 Alexandra Close, Alexandra Avenue, South Harrow, Middlesex. Edwin Williams, W. J. Durnford and J. Auty.

HALLAM, WILLIAM HERBERT, 22 Ipswich Road, S.W.17 ; W. E. Masters, Paul Phipps and O. P. Milne.

HOLMES, ERIC, c/o Messrs. Wallis, Gilbert & Partners, 172 Buckingham Palace Road, S.W.1 ; 63 Ellesmere Avenue, Mill Hill, N.W.7. C. M. Swannell, Thomas Wallis and Frank Cox.

HOOPER, WILLIAM THOMAS, c/o L.M.S. Railway Company Headquarters, Watford, Herts ; 11 Clive Road, Twickenham, Middlesex. F. M. Cashmore, James Cannell and Harry Holland.

HUGHES, GODFREY WILLIAM, M.B.E. (Major R.E.), 136 Mandeville Road, Aylesbury, Bucks. W. T. Higgins, L. F. Bullivant and Frederick Taylor.

JOHNSON, CHRISTOPHER, D.C.R.E., Hipswell, Catterick Camp, Yorks ; "Briarmede," St. Martin's, Richmond, Yorks. Arthur Harrison, T. W. T. Richardson and H. E. Jarvis.

KINGHAM : HENRY (Major), 75 Kennedy Crescent, Kirkcaldy, Scotland. Richard Holt, G. B. Deas and William Williamson.

KINLOCH, WILLIAM, c/o A. J. Morrison, Esq., 87 High Street, Elgin ; "Sunnybank," Kingston-on-Spey, Morayshire. J. D. Mills and the President and Hon. Sec. of the Dundee Inst. of Arch. under Bye-law 3 (*a*).

KIRSOP-WEBB : JOHN, Little Savernake, The Wood End, Wallington, Surrey. Cecil Masey, Briant Poulter and John Grey.

LEDBURY : BERT, Architect's Department, Williams Deacon's Bank, Ltd., 38 Mosley Street, Manchester ; Bank House, Egerton Crescent, Withington, Manchester. H. T. Seward, F. L. Halliday, P. G. Fairhurst.

MANSON, JOHN WELLWOOD, Messrs. James Miller R.S.A. Son & Manson, 15 Blythswood Square, Glasgow, C.2. ; 209, Milngavie Road, Bearsden, Dumbartonshire. James Miller, Alexander Wright and A. G. Henderson.

MARCHANT : GEORGE WILLIAM, Min. of Works, 10 Woodland Road, Bristol ; 12 Downs Cote Park, Westbury-on-Trym, Bristol. S. C. Clark, H. W. Weedon and J. N. Meredith.

MOORE : FRANK EDWARD, c/o Messrs. John Holt & Co. (Liverpool), Ltd., Royal Liver Building, Liverpool ; 92 Church Road, Bebington, Cheshire. S. McLauchlan and the President and Hon. Sec. of the Liverpool Arch. Soc. under Bye-law 3 (*a*).

PAYNE : HENRY GEORGE (Capt. R.E.), 29 Rochester Avenue, Bromley, Kent. W. E. Trent and applying for nomination by the Council under Bye-law 3 (*d*).

PETCH : CECIL ERNEST (Capt. R.E.), 10 Prince Albert Street, Brighton ; "Falsgrave," Lodge Lane, Keymer, Sussex. C. L. Clayton, J. L. Denman and K. E. Black.

WHITE : RICHARD CLAVELL LUKE, Leicester City Corporation (Housing Department), "Steyning," 43 Gainsborough Road, Leicester. J. S. Harrison and the President and Hon. Sec. of the Leicester and Leicestershire Soc. of Arch. under Bye-law 3 (*a*).

WILLIAMSON : HENRY ROCHEAD, X1 Randolph Place, Edinburgh ; 1 Windsor Gardens, Levenhall, Musselburgh, Midlothian. J. R. McKay, J. A. Arnott and John Wilson.

ELECTION: 9 JULY 1946

An election of candidates for membership will take place on 9 July 1946. The names and addresses of the overseas candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Saturday, 29 June 1946.

The names following the applicant's address are those of his proposers.

AS ASSOCIATE (1)

FERGUSON : ROBERT STIRLING [Sch. of Arch., McGill Univ., Montreal], 642 Murray Hill, Westmount P.Q., Canada. J. C. McDougall, H. L. Fetherstonhaugh and Ernest Barott.

MEMBERS' COLUMN

APPOINTMENTS

MAJOR J. H. R. FREEBORN, M.A., F.S.I. [*L.*], has been appointed Architect to the Buckinghamshire Housing Association and the South Midlands and Greater London Housing Association. He has opened offices at 30 Fitzroy Square, W.1, where he will be pleased to receive trade catalogues not already sent to him at Amersham.

MR. H. J. KNOWLES, Dip.Arch. (Liverpool) [*A.*], has taken up an appointment as County Architect to the Berkshire County Council, and his address temporarily is Shire Hall, Reading, where he will be pleased to receive trade catalogues, etc.

MR. HARRY WINBUSH, F.R.A.I.A., [*A.*], has been appointed Head of the School of Architecture, Melbourne Technical College (Australia), and will be pleased to receive trade data and information sheets on matters relating to Architectural and Building Courses, also prospectuses of Architectural and Building Schools.

MEMBERS RELEASED FROM THE SERVICES, ETC.

The following members have notified the R.I.B.A. that they have been released from the Services and are resuming practice and would like to receive trade catalogues, information sheets and other data, etc.

MR. MASON APPS [*A.*], A.M.T.P.I., 11 Granada House, Maidstone, Kent. (Maidstone 4711).

MR. ERIC S. AMBROSE [*A.*], 30 Bisham Gardens, Highgate Village, N.6.

MR. A. R F. ANDERSON [*F.*], resumed practice with Major E. Forster [*A.*]. and Lieut.-Col. J. W. Wilcox [*L.*], at 9 Stone Buildings, Lincoln's Inn, W.C.2.

MR. LAWRENCE K. BOND [*L.*], 11 Elmer Street, Grantham.

MR. PHILIP BEARD [*A.*], City Architect's Department, Plymouth.

MR. OSWALD BRAKSPEAR [*A.*], 44a High Street, Corsham, Wilts.

MR. THOMAS BURRINGTON [*A.*], 22 High Street, Swindon, Wilts.

MR. H. M. BARKER [*L.*], "Barton House," 10 King Street, Deal.

MR. SYDNEY P. BUSH [*F.*], Consulting Architect to Government of Burma, c/o Chief Engineer Buildings and Roads, P.W.D. Secretariat, Rangoon, Burma. Trade catalogues, etc., for materials suitable in a tropical climate.

MR. J. GORDON BERRY, M.C. [*A.*], Messrs. Joseph Berry & Sons, 5 Market Walk, Huddersfield.

MR. K. T. CADBURY-BROWN [*A.*], 17 Clarges Street, W.1. (May 1884).

MR. J. B. S. COMPER [*F.*], 36 Sloane Court, London, S.W.3.

LIEUT.-COL. ERIC COLE [*F.*], Dyer Street House, Cirencester.

MR. DAVID CLARKE [*A.*], 81 Terminus Road, Eastbourne.

MR. COLIN R. CRICKMAY [*A.*] and Mr. Hugh W. Crickmay [*A.*], recommencing practice at 23 St. Thomas Street, Weymouth, under the title of Crickmay & Sons.

MR. F. L. CHARLTON [*F.*], Gordon Chambers, 21 Bond Street, Leeds, 1.

MR. JOHN P. COIA [*A.*], Messrs. Gillespie, Kidd & Coia, 19 Waterlow Street, Glasgow, C.2.

MR. C. W. COSTER [*A.*], 22 The Newlands, Wallington, Surrey.

MAJOR ANTHONY R. DANNATT, R.E. [*A.*], Messrs. A. R. Dannatt & Son, 43 Duke Street, Chelmsford.

MR. M. H. DE L'ORME [*L.*], in partnership with Mr. Lawrence M. Gotch, at 2 Bunhill Row, London, E.C.1.

MR. H. M. R. DRURY [*A.*], Surveyor to Dean & Chapter, Church House, The Close, Exeter.

LIEUT.-COL. W. H. GLEN DOBIE, late R.E. [*A.*], Messrs. Morter & Dobie, 11 Rumford Street, Liverpool.

MAJOR P. W. T. ELFORD [*L.*], Messrs. Barron, Rooke & Partners, 17 Grimstone Terrace, Houndiscombe Road, Plymouth.

MAJOR H. W. ELLIS, R.E. [*A.*], 20 Hurst Avenue, West Worthing, Sussex.

MR. P. G. FREEMAN [*A.*], 96 Dorset House, Gloucester Place, London, W.1. (Welbeck 8898).

MAJOR E. M. GALLOWAY [*A.*], 48 The Avenue, Southampton.

MR. JOHN L. GAULDIE [*A.*], 52 Kirk Brae, Liberton, Edinburgh.

LIEUT.-COL. G. H. HAWKINS, R.A. [*A.*], Messrs. Matkin & Hawkins, Barclay Chambers, Fawcett Street, Sunderland.

MR. H. ST. JOHN HARRISON [*F.*], 1 Babmaes Street, London, S.W.1. (Whitehall 0295).

MR. J. KENNEDY HAWKES [*A.*], Lynton, Woodside Avenue, Esher, Surrey.

MR. W. H. HENRY [*L.*], County Architect, Town Hall, Alloa.

MR. IVAN S. HODGESS [*A.*], 10 Queen Anne Terrace, Plymouth.

MR. G. C. HOUGH [*A.*], Greenloaning, West Common Close, Harpenden, Herts.

CAPTAIN J. E. JACKSON [*A.*], 149 Sandgate Road, Folkestone, Kent.

MR. A. H. H. JENKINS [*A.*], 18 Evelyn Court, Stourcliffe Street, W.1.

MR. H. S. JARRATT [*A.*], 4 The Drive, Hove, Sussex.

MR. JAMES JENNINGS [*L.*], Market Place, Ambleside, Westmorland.

MR. G. M. KINGSFORD [*F.*], 11 Garrick Street, W.C.2.

MR. HAROLD A. KAY [*A.*], Messrs. Robinson & Kay, Victoria Chambers, Stourbridge.

MAJOR R. ALAN LAMBOURN [*L.*], Hambleton Cottage, Bolton Abbey, Skipton, Yorks.

MR. L. C. LOMAS [*F.*], County Architect, Worcestershire County Council, 59 The Tything, Worcester.

MR. W. LYNN-THOMPSON [*A.*], The "Ingles," Hawkhurst, Kent.

MAJOR J. E. LANCASHIRE, R.E. [*A.*], Messrs. W. H. Lancashire & Son, 54 Campo Lane, Sheffield, 1. (Sheffield 25979).

MAJOR J. W. LEE, R.E. [*A.*], 51 Belmont Road, Portswood, Southampton.

MR. HEDLEY B. MARSHALL [*A.*], Albert Chambers, 10 Derby Road, Nottingham.

MR. C. B. K. MILNES [*A.*], c/o Messrs. Collins & Greene [*F/F.*], Regent Chambers, 15 Westover Road, Bournemouth.

MAJOR A. L. MORTIMER [*F.*], 85 Gledhow Lane, Leeds, 8.

LIEUT.-COMMANDER B. L. MOIR [*A.*], Mayroyd, Bamford, Rochdale.

CAPTAIN A. J. MCLEAN, R.E. [*F.*], "Brog," Clayton Avenue, Hassocks, Sussex.

LIEUT.-COL. GUY N. NICHOLLS, R.E. [*L.*], 5 Grosvenor Crescent, Hyde Park Corner, London, S.W.1.

MR. DOUGLAS E. NIGHTINGALE [*A.*], 107a Queensway, W.2.

MR. LOUIS OSMAN, B.A.(Arch.) [*A.*], 9 Barton Street, Westminster, S.W.1.

MR. CHARLES E. PEARSON [*F.*], Messrs. C. B. Pearson & Son, 18 Dalton Square, Lancaster. (Lancaster 582).

MR. H. DENT PRIESTMAN [*A.*], Prince's Dock Chambers, Princes Dockside, Hull. (Hull 35440).

MAJOR RONALD A. PHILLIPS, R.E. [*F.*], Bush House, 15 Christchurch Road, Bournemouth. (Bournemouth 7120).

MR. E. A. REMNANT [*F.*], 15 Fernshaw Road, Chelsea, S.W.10.

MAJOR K. H. SAUNDERS, R.E. [*A.*], City Architect's Department, Portsmouth.

MR. W. R. STENNER [*A.*], 19 Redland Park, Bristol, 6.

MAJOR H. J. STRIBLING, R.E. [*F.*], Rotherfield, Stoke Poges, Bucks.

MR. C. E. SCANLON [*A.*], "Aberfoyle," Chesham Place, Bowden, Ches.

MAJOR M. TROTTER, R.E. [*L.*], 10 Linden Grove, West Hartlepool.

MR. H. B. TOWNER [*L.*], 220 High Street, Uckfield, Sussex.

MR. A. A. TAIT [*A.*], 100 High Street, Grahamstown, S. Africa.

MAJOR A. UNDERHILL, R.E. [*A.*], Hartley House, 105 South End Road, N.W.3, in partnership with Mr. Oswald P. Milne [*F.*].

MR. P. E. WALKER [*A.*], P.A.S.I., Engineer's Department, Pontypridd, U.D.C. (Chief Architectural Assistant).

MR. RONALD WARD [*F.*], 33 St. George's Drive, Westminster, S.W.1. (Vic. 5531).

MR. JOHN WIGNALL [*L.*], 41 Hoghton Street, Southport, Lancs.

MR. NORMAN C. WESTWOOD [*A.*], Messrs. P. J. Westwood & Sons [*F/A.*], Nutfield, Heath Road, Weybridge, Surrey. (Weybridge 182).

LIEUT.-COL. J. P. M. WRIGHT, R.E. [*A.*], 10 Main Street, New Elgin, Moray.

MR. T. S. S. WORTHINGTON [*A.*], Messrs. Thomas Worthington & Sons, 178 Oxford Road, Manchester.

MR. FELIX WALTER [*L.*], The New Rectory, Dallinghoo, Woodbridge, Suffolk.

MR. G. L. CADELL [*A.*], 90a Westbourne Terrace, W.2.

MR. J. A. CARRICK [*A.*], Wellington House, 7 Alloway Place, Ayr.

MAJOR L. J. CARPENTER, R.E. [*A.*] has commenced practice in partnership with Mr. E. L. Haynes at 123-4 Newgate Street, E.C.1. (Monarch 2901).

MR. M. D. ROBINSON [*L.*], 130 High Street, Rickmansworth, Herts. Rickmansworth 2194). He has ceased to practise in the name of McCall & Robinson at Blackburn.

MR. RONALD DEMUTH [*L.*], 37 Great James Street, Bedford Row, W.C.1. (Holborn 9060).

MR. BASIL G. DUCKETT, D.F.C. [*A.*], 80 Wimpole Street, W.1.

MR. M. R. FLETCHER [*L.*], 13 Ambrose Place, Worthing.

MR. N. H. FOWLER, Messrs. Kitson, Parish, Ledgard & Pyman, Lloyds Bank Chambers, Vicar Lane, Leeds, 1. (Leeds 22000).

MR. DOUGLAS HALL [*A.*], National Provincial Bank Chambers, Bangor, N. Wales.

MR. GEDDES HYSLOP [*F.*], 6 Endsleigh Place, W.C.1. (Euston 2650).

MR. W. N. M. MILES [*A.*], Walton-in-Gordano, Clevedon, Somerset.

MR. K. J. H. SEYMOUR [*A.*], 118 Princes Avenue, W.3.

MR. FELIX WALTER [*L.*], 1 Quay Street, Woodbridge, Suffolk.

MR. C. E. WESTMORELAND [*A.*], 16 Acol Court, Hampstead, N.W.6. (Maida Vale 5939).

LIEUT.-COL. R. W. ROBSON, R.E. [*L.*] is entering into partnership with his father, Matt. C. Robson [*L.*]. The firm will practice under the style of Matt. C. Robson & Son, at Station Chambers, Bishop Auckland.

MAJOR T. H. B. BURROUGH, R.E. [*A.*], Burrough & Hannam, 25 Orchard Street, Bristol, 1. (Bristol 22901).

MAJOR F. L. HANNAM, R.E. [*A.*], Burrough & Hannam, 25 Orchard Street, Bristol, 1. (Bristol 22901).

MR. E. N. CLIFTON, B.A. [*F.*], F.S.I., has resumed partnership in the firm of Gunton & Gunton, Architects and Surveyors, Empire House, St. Martin's le Grand, E.C.1.

MR. PHILIP HARDY [*F.*] has recommenced practice at 124 Old Christchurch Road, Bournemouth, after service with the W.D.

CAPT. G. M. MCCORQUODALE [*L.*], 92 High Street, Marlow, Bucks.

PRACTICES AND PARTNERSHIPS

MESSRS. DOLMAN, GREENWOOD, HOLMAN, KEMP, SMITH & CO. would like to hear from other members of this group. Please write to H.G., c/o R.I.B.A. JOURNAL, or telephone Langham 1838.

MR. TERENCE CARR [*F.*] has resumed practice temporarily at Garthowen, Hockering Gardens, Woking, Surrey (Woking 2193), where he will be pleased to receive trade catalogues, etc.

MR. SYDNEY CLOUGH [*F.*] is practising from 115 Park Street, Park Lane, W.1, in partnership with Mr. D. M. Clough and Mr. S. H. Statham [*A.*], F.I.C.D. The firm is now known as Sydney Clough, Son & Partners.

MR. H. T. HICKMAN [*A.*], 5 Blackwell Scar, Carmel Road South, Darlington, Co. Durham, will be pleased to receive trade catalogues, etc., particularly relating to rural housing, at that address.

MRS. R. E. NAGELSCHMIDT [*A.*] (Miss R. E. Benjamin) has restarted practice at 52 Truro Road, St. Austell, Cornwall (St. Austell 131), where she will be pleased to receive trade catalogues, etc.

MESSRS. LEWIS SOLOMON & SON [*F/F.*] have taken into partnership Mr. Morris Joseph [*F.*], F.S.I. The name of the firm remains unchanged and the practice will continue from 21 Bloomsbury Way, W.C.1 (Holborn 5108-9).

MR. J. P. TINGAY [*A.*], A.A. Hon. Dip., is now in practice at Broughton House, 6, 7, 8 Sackville Street, W.1, where he will be pleased to receive trade catalogues, etc.

MR. J. P. WORROW has reopened practice at 12 Adeline Place, Bedford Square, W.C.1. The practice was formerly known as H. & J. Worrow. He would be pleased to receive trade catalogues, etc.

THE ESSEX COUNTY ARCHITECT will be pleased to receive new copies of all trade catalogues as soon as possible at the County Hall, Chelmsford.

MR. S. F. PERCY [*L.*] has been appointed Senior Architectural Assistant to Teignmouth Urban District Council, S. Devon.

MR. T. H. B. BURROUGH [*A.*], A.R.W.A., and Mr. F. L. HANNAM [*A.*] have entered into partnership and are practising under the title of Burrough & Hannam, at Mr. Burrough's old address, 25 Orchard Street, Bristol, 1. They will be pleased to receive trade catalogues, etc.

MR. A. R. A. BLAY [*L.*] is now in practice at 44 St. Giles, Oxford, and will be pleased to receive trade catalogues, etc.

MR. C. F. J. THURLEY [*L.*], has resumed practice at Central Chambers, 52a Hyde Road, Paignton, S. Devon, where he would be pleased to receive trade catalogues, etc.

PARTNERSHIPS WANTED AND AVAILABLE

FELLOW, formerly in practice in London, now released from war appointment, wishes to return to private practice and would like partnership with established firm. Capital if required.—Apply Box 217, c/o The Secretary, R.I.B.A.

MR. G. B. BAGNALL [*L.*] has obtained his release from the War Department and is entering into partnership with Mr. R. O. L. Lovell, Surveyor, at The Red House, High Street, Lymington, Hants. The style of the firm will be known as Bagnall & Lovell.

ASSOCIATE (Major R.E.), age 36, fully experienced, due for release May, desires partnership with, or succession to, established architect having live practice.—Apply Box 214, c/o The Secretary, R.I.B.A.

ASSOCIATE desires to purchase working partnership in established practice in Manchester district, preferably with a view to eventual control.—Apply Box 224, c/o The Secretary, R.I.B.A.

ASSOCIATE (ex-Major R.E.), age 31, seeks provincial partnership, preferably South Coast or South-West England. Eight years' general civil experience. Capital available.—Apply Box 216, c/o The Secretary, R.I.B.A.

ASSOCIATE, A.A.Dip. (R.E. officer), age 33, now on refresher course, with pre-war small town practice in Kent, is anxious to extend scope by partnership with practising architect(s) in larger centre in Kent or London area.—Apply Box 211, c/o The Secretary, R.I.B.A.

ASSOCIATE, age 34, requires senior position with established practice with a view to junior partnership. Preferably N. or N.E. area.—Apply Box 213, c/o The Secretary, R.I.B.A.

ASSOCIATE (33), married, able designer, responsible and energetic, especially experienced in housing, flats and schools, desires senior appointment with a view to partnership. Outside London, East and South preferred. Available at one month's notice.—Apply Box 212, c/o The Secretary, R.I.B.A.

JUNIOR PARTNER required in large architectural practice on South Coast. Single man preferred owing to housing difficulties, but not essential. Good knowledge of quantity surveying would be an asset. Good designer. Capital essential.—Apply Box 220, c/o The Secretary, R.I.B.A.

ASSOCIATE (31), at present in charge of large commercial architect's office, desires appointment with view to partnership.—Apply Box 226, c/o The Secretary, R.I.B.A.

ARCHITECT (42), 24 years London and Provincial experience, requires partnership in South Coast town. Good prospects of own work and reasonable capital available.—Apply Box 231, c/o The Secretary, R.I.B.A.

ACCOMMODATION

ARCHITECT with pre-war practice leaves Services in June and wishes to share offices with an established architect. Would consider partnership.—Apply Box 218, c/o The Secretary, R.I.B.A.

ASSOCIATE, just commencing practice in London, requires office accommodation. One or two rooms. Would be in a position to assist another architect pending development of practice.—Apply Box 219, c/o The Secretary, R.I.B.A.

ASSOCIATE requires office in W.C., W. or N.W. London or share of accommodation with another member.—Apply Box 221, c/o The Secretary, R.I.B.A.

CHANGES OF ADDRESS

MR. A. STANLEY BARNES, Dipl.Arch. [*A.*], has removed to 46 Prebend Gardens, Stamford Brook, W.6, and would be pleased to receive trade catalogues, etc.

320341 CAPT. C. M. BOND, R.E. [*A.*], c/o C.E. H.Q. 3 District, C.M.F.

MR. WALTER ROSSER [*F.*] has removed to 20 Derngate, Northampton (Northampton 4906), where he will be pleased to receive trade catalogues, etc.

WANTED AND FOR SALE

FELLOW wishes to purchase Double Elephant Plan Printing Machine, Serious or similar.—Apply Box 222, c/o The Secretary, R.I.B.A.

WANTED TO PURCHASE, new or second-hand, *Quantities*, by Prof. Banister Fletcher (not older than 11th edition).—D. F. Chrisfield [*L.*], Clarendon House, Broadstairs.

FOR SALE. Stanley dumpy level, on four screws, 10 in. long, complete with tripod and staff. £30 or near offer. Seen at the offices of Messrs. Hallet, Fox & White, 141 Moorgate, E.C.

FOR SALE. Set of 13 piece Stanley instruments in hardwood case; 8 in. adjustable set-square; 12 in. Ivorine (pre-war) slide rule.—Apply Box 223, c/o The Secretary, R.I.B.A.

FOR SALE. Set of modern stainless drawing instruments by Richter, in case containing about 15 pieces, including compasses and dividers (both pencil and ink), with lead refills and extra pens. Seen during working hours in the Accident Department, Century Insurance Co., Ltd., 7 Leadenhall Street, E.C.3.

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